EXHIBIT A

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

IN RE: OPENAI, INC., COPYRIGHT INFRINGEMENT LITIGATION This Document Relates To: All Actions	Case No. 1:25-md-03143-SHS (OTW)

[PROPOSED] *AMICI CURIAE* BRIEF OF COMPUTER SCIENTISTS

IN SUPPORT OF OPENAI, INC.

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IDENTITIES AND INTERESTS OF AMICI CURIAE

Mike Knoop, Professor Daniel Lowd, and Professor Douglas C. Schmidt (collectively, the "*Computer Scientist amici*") respectfully submit this brief as *amici curiae* in support of defendants' motion for summary judgment on the defense of fair use.

Mike Knoop is a technology entrepreneur and AI researcher. He is a co-founder of the ARC Prize Foundation (arcprize.org), which develops and manages the ARC-AGI benchmark, an influential series of general intelligence benchmarks used by every major frontier AI lab to test and guide AI research. His work as an AI researcher involves deeply studying and understanding frontier AI capabilities. He is also a co-founder of Ndea (ndea.com), an AI research lab that combines deep learning and program synthesis to build new AI systems, and it has been his full-time focus for the past two years. He previously co-founded Zapier, a software company focused on workflow automation.

Professor Daniel Lowd is a Professor in the Department of Computer Science at the University of Oregon. He is a computer scientist whose research concerns machine learning and artificial intelligence, the technologies at issue in this litigation. His published work addresses adversarial machine learning, privacy, interpretable AI, and probabilistic and relational models. He has received a Google Faculty Research Award, an Army Research Office Young Investigator Award, and a best paper award from DEXA, an internationally renowned conference focusing on, among other things, artificial intelligence and machine learning.

Douglas C. Schmidt is the inaugural Dean of William & Mary's School of Computing, Data Sciences & Physics. Before joining William & Mary, Dr. Schmidt served as the Director of Operational Test and Evaluation for the U.S. Department of Defense and previously held several leadership positions at Vanderbilt University, including Cornelius Vanderbilt Professor of Engineering, Associate Provost for Research, and Co-Director of the Data Science Institute. His

expertise bears on the issues here in four specific respects: software architecture and distributed systems; operational test and evaluation for mission- and safety-critical systems; empirical assessment of complex software and AI systems; and evaluating whether a system's behavior in deployment matches the technical claims made about it.

Amici's sole interest in this proceeding is to help ensure that the Court's fair-use analysis rests on a technically accurate account of how large language models ("LLMs") are trained and how they generate text. They take no position on any issue beyond how these technical premises impact the fair-use analysis. They take no position on the ultimate merits of any party's claims or damages. No party or party's counsel authored this brief in whole or in part. No party, party's counsel, or other person—other than the *Computer Scientist amici* and their counsel—contributed money that was intended to fund preparing or submitting this brief.

The Court contemplated assistance from *amici* as it considers summary judgment on fair use.[1] The *Computer Scientist amici* respectfully submit that the fair-use inquiry should turn on the underlying technical premises. This inquiry asks whether a trained model "stores and retrieves copies" of copyrighted works and whether models "reproduce protected expression to the public." Those are empirical questions about which the *Computer Scientist amici* have domain expertise. Plaintiffs' Third Amended Complaint alleges that "LLM parameters encode retrievable copies of many of [the] training works."[2] The central question is whether that characterization is technically accurate or instead substitutes a metaphor for a mechanism. It is precisely the kind of question on which this Court would benefit from independent scientific input. *Cf. Google LLC v. Oracle Am., Inc.*, 593 U.S. 1, 23 (2021) ("And just as fair use takes

[1] *See* Dkt. No. 2049.

[2] Pls.' Third Am. Compl. ¶ 80, Dkt. No. 1677.

account of the market in which scripts and paintings are bought and sold, so too must it consider the realities of how technological works are created.").

The Appendix includes Amici's curricula vitae, setting out Amici's qualifications to assist the Court in greater detail.

SUMMARY OF ARGUMENT

This brief explains a narrower technical point relevant to fair use: training is a computational use of text to fit numerical model parameters, not ordinarily a system for storing and retrieving the source works. During training, an LLM breaks text into tokens and adjusts numerical parameters to capture statistical relationships across a vast and diverse corpus. It then uses those captured relationships to generate text from the tokens in response to new prompts.

LLMs can sometimes "memorize" training material—meaning generate a nearly exact replica of text they were trained on—such as text that appears numerous times in the training corpus. But LLMs do not memorize most of the text they are trained on, and how much and what a given model memorizes is an empirical question that depends on the particular model and how it was trained. Memorization is distinct from the ordinary operation of a trained model, and established techniques such as deduplication, post-training controls, and input and output filters are used to reduce the reproduction of copyrighted material in practice. Recent research indicates that OpenAI's safeguards are effective in preventing substantial extraction of copyrighted text, even under adversarial jailbreaking techniques that ordinary users do not employ.[3]

That computational use is important because training uses works for a purpose fundamentally different from their expressive purpose. Rather than republishing those works,

[3]Ahmed Ahmed, A. Feder Cooper, Sanmi Koyejo & Percy Liang, *Extracting Books from Production Language Models*, arXiv:2601.02671v1, Jan. 6, 2026, at 1–5, 14, 17.

training produces a general-purpose tool capable of translation, research, tutoring, creative assistance, and many other tasks. The courts in *Bartz* and *Kadrey* described that training use as highly or quintessentially transformative. *Bartz v. Anthropic PBC*, 787 F. Supp. 3d 1007, 1022 (N.D. Cal. 2025); *Kadrey v. Meta Platforms, Inc.*, 788 F. Supp. 3d 1026, 1044 (N.D. Cal. 2025).

The same technical distinction applies to deployed systems, which include safeguards intended to limit the reproduction of training material. In *Kadrey*, the plaintiffs' expert stated that Llama could not reproduce "any significant percentage" of those books. 788 F. Supp. 3d at 1042. In *Bartz*, software placed between users and the underlying model prevented infringing output from reaching users. 787 F. Supp. 3d at 1021. These two other courts appear to have agreed with the technical points supported in this brief: LLM training learns general patterns to create a new tool, and safeguards can limit the reproduction of protected expression when that tool is deployed.

ARGUMENT

I. HOW LLM TRAINING FITS MODEL PARAMETERS AND GENERATES TEXT

A. Training adjusts weights that encode statistical relationships; a trained model is not an addressable repository of stored work.

LLMs are designed to generate language in response to user queries. These models are built by way of a technique called machine learning. "Learning" is a term used by AI researchers in a specific technical sense that has very little commonality with human or animal learning. By leveraging mathematical calculations, computer systems that use machine learning can identify patterns from data rather than being programmed with a rule for every situation.

LLMs use machine-learning models based on neural networks to make predictions. A neural network is a mathematical model composed of interconnected layers of simple computational units that perform arithmetic operations on inputs to produce an output. A neural

network is deep when information passes through a large number of these units *en route* from input to output, allowing it to learn complex representations. LLMs commonly use the transformer, a type of neural-network architecture that relies on so-called attention mechanisms. First proposed in a 2017 paper by Google researchers titled "Attention Is All You Need,"[4] which has since been cited hundreds of thousands of times, transformers have revolutionized the field.[5]

Before training, text is broken into tokens—common sequences of characters that can represent a word or part of a word. In widely used tokenization systems, a token averages roughly three letters. During LLM training, these systems adjust numerical parameters, or weights, to improve their ability to predict upcoming tokens given the preceding context. The model then learns through self-supervision: the training text itself supplies the correct answer as the model repeatedly tries to predict the next token. In simplified form, the process is: source text is tokenized, the model predicts the next token, the weights are adjusted to improve the accuracy of this prediction, and the resulting parameters are used to respond to new prompts. For example, if the preceding text is "[t]he water of Walden Pond is so beautifully," a language model might assign probabilities such as P(blue)=0.42, P(green)=0.18, P(clear)=0.06, P(refrigerator)=0.00.[6] Each prediction produces a probability for every possible next token. The purpose of this process is to improve the probability assigned to sequences of text from the training corpus. What remains after training is a set of numerical parameters of the neural network that encodes broad patterns found in the training data. As one technical survey explains, next-token training allows a

[4] Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Łukasz Kaiser & Illia Polosukhin, *Attention Is All You Need*, 30 Advances in Neural Information Processing Systems 5998 (2017).

[5] Helen Pearson, Heidi Ledford, Matthew Hutson & Richard Van Noorden, *Exclusive: The Most-Cited Papers of the Twenty-First Century*, Nature (Apr. 22, 2025), https://www.nature.com/articles/d41586-025-01125-9.

[6] *See* Daniel Jurafsky & James H. Martin, *N-Gram Language Models*, Speech and Language Processing, 3 (3d ed. draft Aug. 19, 2026), https://web.stanford.edu/~jurafsky/slp3/3.pdf.

model to capture patterns in vocabulary, grammar, meaning, and text structure, thereby "encoding a vast amount of linguistic knowledge into its parameters."[7]

The scale of the data and the model also confirm that training is necessarily lossy. Frontier training corpora are on the order of hundreds of trillions of tokens (roughly 200 trillion), while frontier models have on the order of one trillion parameters.[8] Compressing a corpus of that scale into a model with far fewer numerical parameters is incompatible with storing the complete training data. As a result, the text a model does memorize—in this context, text it can reproduce as an exact or near-exact duplicate—tends to be text that appears many times in the training corpus. Famous passages from classic works, such as Hamlet's soliloquy, are an example: they may be reproduced verbatim precisely because they have been quoted countless times across the corpus, and many such passages are long out of copyright. Large language models are trained for productive generalization rather than rote memorization. Every deep-learning technique must contend with the tension between fitting particular examples and generalizing from them, and the field has developed increasingly sophisticated methods to steer models toward generalization, alongside separate measures to minimize reproduction of copyrighted material. One important advance was the development of AI reasoning models, beginning with OpenAI's o1 model in 2024.[9] By employing an embedded "chain of thought" process, reasoning models "deep think"

[7] Yiheng Liu et al., *Understanding Large Language Models: A Comprehensive Overview from Training to Inference*, arXiv:2401.02038v2, at 10 (2024).

[8] Nestor G. Pestelos Jr., *Frontier Models, Architectures, and Tokens*, https://ngpestelos.com/reference/frontier-models/ (last visited Oct. 29, 2026).

[9] Mike Knoop, *ARC Prize 2025 Results & Analysis*, ARC Prize (Dec. 5, 2025), https://arcprize.org/blog/arc-prize-2025-results-analysis (describing the breakthrough of "chain-of-thought reasoning" as a "profound upgrade in AI capability").

through step-by-step reasoning before generating responses, favoring generalization over strict recitation.[10]

B. Why language models generalize beyond particular training examples.

LLMs demonstrably generalize beyond particular examples in their training data: they can respond to new or unfamiliar prompts and tasks that were not copied from any one source work.[11] That behavior shows that training serves to fit model parameters to general statistical relationships, not to reproduce or preserve the source works as stored files.[12]

After training, an LLM generates text one token at a time by assigning probabilities to possible next tokens, selecting one, adding it to the text, and repeating the process.[13] The trained model maps the prompt and prior tokens to a probability distribution; a separate decoder applies a selection rule to choose the next token. The text is thus generated when the model responds to a prompt, rather than retrieved as a complete passage from a conventional database.

C. Pre-training generalizes to new contexts; safeguards limit memorization.

Generalization and memorization are distinct phenomena. Training on a large and varied collection enables a model to respond to prompts not encountered during training, supporting the

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[10] *See* Jun Wang, *A Tutorial on LLM Reasoning: Relevant Methods Behind ChatGPT o1*, arXiv:2502.10867, Feb. 15, 2025, at 1 ("A key innovation of o1 is that it allows spending more time reasoning during the inference process, marking a shift from fast, direct responses to slow, deliberate, multi-step inference-time computation.").

[11] *See* Mike Knoop, *OpenAI o1 Results on ARC-AGI-Pub*, ARC Prize (Sept. 13, 2024), https://arcprize.org/blog/openai-o1-results-arc-prize (noting that reasoning models chain of thought technique is one way to "surmount the #1 issue of large language model generalization: the ability to adapt to novelty").

[12] Liu et al., *supra* note 7, at 6, 10 (explaining that diverse training data enhances generalization and that pretraining produces language representations that can be adapted to new tasks); Rebecca Li, Andrea Parker & Justin Tenuto, *Current Best Practices for Training LLMs from Scratch*, 8 (Weights & Biases ed., 2024) ("Dataset diversity is especially important for LLMs . . . because [it] improves cross-domain knowledge . . . [and] downstream generalization.").

[13] Daniel Beaglehole, Adityanarayanan Radhakrishnan, Enric Boix-Adserà & Mikhail Belkin, *Toward Universal Steering and Monitoring of AI Models*, arXiv:2502.03708, May 28, 2025, at 3–4 (explaining that the model applies softmax to produce a probability distribution and samples the next token).

conclusion that it learns patterns applicable to new contexts rather than simply storing source works.[14]

A trained model is not an addressable document repository and does not ordinarily retrieve identified training data as stored files. There is no address, index, or file handle by which particular training data can be requested and returned; generation instead proceeds by producing a probability distribution for the next token and selecting from it.

Researchers have demonstrated that "memorization" can nevertheless occur, and this is measured using memorization accuracy—how often the model predicts the original next token—and extraction likelihood—the overlap between generated and original token sequences.[15] Researchers have also demonstrated that such "memorization" is reduced through safeguards. For example, one method is called "deliberate imagination," which trains models to prioritize imaginative and varied responses, producing responses that are contextually relevant, imaginative, and less reliant on memorized data.[16] Other safeguards can operate during training and deployment: deduplicating training data can reduce memorization, while post-training controls and input and output filters can prevent memorized material from reaching users.[17] *See Kadrey*, 788 F. Supp. 3d at 1041–42, 1051.

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[14] *See supra* note 12; Mike Knoop, *An Analysis of DeepSeek's R1-Zero and R1*, ARC Prize (Jan. 29, 2025), https://arcprize.org/blog/r1-zero-r1-results-analysis (describing reasoning models' ability to generate "new" data to train on as opposed to regurgitating data in their training set).

[15] Yijiang River Dong, Hongzhou Lin, Mikhail Belkin, Ramon Huerta & Ivan Vulić, *Unmemorization in Large Language Models via Self-Distillation and Deliberate Imagination*, arXiv:2402.10052, Feb. 15, 2024, at 4 (defining memorization accuracy as next-token match and extraction likelihood as n-gram overlap, and explaining that the measures vary with prompt length).

[16] *Id.* at 5, 8 (reporting experiments on GPT-Neo models with 125 million, 1.3 billion, and 2.7 billion parameters and reductions in extraction likelihood while largely preserving generation quality and natural language understanding performance).

[17] *Id.* at 2 (explaining that data deduplication and private training reduce memorization and strengthen privacy guarantees); Li, Parker & Tenuto, *supra* note 13, at 9 (describing fuzzy deduplication using locality-sensitive hashing).

Courts have found that these safeguards work. In *Kadrey*, the court noted that plaintiffs' expert conceded Llama could not reproduce "any significant percentage" of those books, *see id.* at 1042, 1051, while *Bartz* found that software between users and Claude's underlying model and input/output filtering ensured that no infringing output reached users. *Bartz*, 787 F. Supp. 3d at 1018, 1021. These findings show that standard safeguards can minimize the reproduction of memorized material to users. Recent research on OpenAI's models is consistent with those findings. In a study of attempts to extract copyrighted books from production models, OpenAI's GPT-4.1 refused direct requests to reproduce book text. Researchers could elicit any reproduction only through jailbreaking—adversarial prompts with randomly scrambled characters and capitalization, which bear no resemblance to how ordinary users interact with ChatGPT. Even then, the jailbroken model required thousands of attempts and would eventually refuse to continue, such as after providing text from the first chapter.[18]

II. THE TECHNICAL FACTS CONFIRM THAT TRAINING IS TRANSFORMATIVE (FAIR USE FACTOR 1)

An LLM transforms source material by fitting numerical parameters to statistical relationships across tokens. That computational use is distinct from storing or retrieving source works and is transformative under the first fair-use factor.

Amici understand that the first fair-use factor considers whether LLMs "add[] something new, with further purpose or different character." *Andy Warhol Found. for the Visual Arts, Inc. v. Goldsmith*, 598 U.S. 508, 528 (2023) (citing *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 579 (1994)). LLMs do not ordinarily store copies of copyrighted works for retrieval or

[18] Ahmed, Cooper, Koyejo & Liang, *supra* note 3, at 1–3, 14, 17 (reporting that GPT-4.1 required substantially more jailbreaking attempts than other models tested and "eventually refuse[d] to continue," limiting extraction of *Harry Potter and the Sorcerer's Stone* to 4.0% of the book, from the first chapter only).

reproduction. *See supra* Section I.A. That is because an LLM is trained by extracting statistical probabilities from a vast corpus and fitting those relationships into numerical parameters. This training allows the model to function as a general-purpose tool for countless tasks. Its ability to generalize beyond particular examples reinforces that training serves a computational purpose different from reproducing the source works. In sum, extracting tokens and statistical probabilities from copyrighted works in order to produce a general-purpose tool that can generate text for new prompts and tasks is plainly a "further purpose" with a fundamentally "different character" than the works' expressive purpose.

For these reasons, Class Plaintiffs' view that LLMs function "through a process of compression-memorization" does not comport with *Amici*'s technical understanding of LLM training.[19] When an LLM digests a work, it breaks the work's text into tokens and then extracts the statistical relationship between the sequence of tokens leading up to a particular point, and the next token, to improve its probabilistic model. *See supra* Section I.A. LLM training is not designed to encode data for memorization or recall. Rather, it predicts masked or next tokens and updates parameters billions or trillions of times across a corpus of language and text to generalize to new contexts, and LLMs do not memorize most of the text they are trained on. *See supra* Section I.A. Contrary to Class Plaintiffs' claim that LLMs are "optimize[d] . . . to faithfully reproduce the training data," LLMs are not document repositories that ordinarily retrieve identified training data as stored files.[20] *See supra* Section I.C. As Class Plaintiffs readily acknowledge, "not . . . every piece of training data is perfectly captured in reproducible form

[19] Class Pls.' Mem. of Law in Opp'n to OpenAI Defs.' Mot. for Summ. J., Dkt. 2271 at 30.

[20] *Id.* at 22.

inside OpenAI's LLMs."[21] Consistent with that acknowledgment, the extent of memorization is an empirical question that varies by model and training process, and various interventions can reduce memorization and the reproduction of memorized material in deployed systems, even when confronted with adversarial testing. *See supra* Section I.C.

Indeed, *Bartz* and *Kadrey* both agreed that training LLMs was "quintessentially," *Bartz*, 787 F. Supp. 3d at 1022, or "highly" transformative, *Kadrey*, 788 F. Supp. 3d at 1044. The LLM trains upon works but then "turn[s] a hard corner [to] create something different," *Bartz*, 787 F. Supp. 3d at 1022, "all distinct from creating or reading an expressive work like a novel or biography—for instance, to find recipes, get tax or medical advice, translate documents, or conduct research." *Kadrey*, 788 F. Supp. 3d at 1044. Those use cases (not to mention innumerable others) are orthogonal purposes to those of any copyright holder. *See Warhol*, 598 U.S. at 528–33 (first factor asks whether the secondary use has a purpose distinct from the original's); *Authors Guild v. Google, Inc.*, 804 F.3d 202, 214, 217 (2d Cir. 2015) (use that "communicates something new and different from the original" is transformative); *Campbell*, 510 U.S. at 579. Given that OpenAI's models function as a general-purpose tool with virtually limitless application, there can be "no serious question" that the secondary use is "highly transformative." *Kadrey*, 788 F. Supp. 3d at 1044.

III. TRAINING USES UNPROTECTABLE PATTERNS, NOT PROTECTED EXPRESSION (FAIR USE FACTOR 2)

LLMs train on the statistical relationship between the sequence of tokens leading up to a particular point, and the next token, not on the protected expression of a given work.

[21] *Id.* at 23 n.1.

Amici understand that the second fair-use factor considers the nature of the copyrighted work. Copyright affords less protection to what an LLM utilizes: a work's raw "functional or factual aspects." *Sega Enterprises Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1524–26 (9th Cir. 1992).

The technical record confirms that LLMs train on unprotected functional elements. An LLM breaks text into word or word-piece "tokens" and assigns those tokens numerical vectors. *See supra* Section I.A. This process is repeated until the LLM has a sufficient training corpus comprising trillions of tokens from twenty billion unique texts. *See supra* Section I.A. The model considers the statistical relationship between a new token and the sequence of tokens leading up to it. *See supra* Section I.A. It is this statistical relationship, not the underlying expressive content of the copyrighted work itself, upon which the model draws. *See supra* Section I.A. Training does not select for a work's creative elements; it operates over all of the text, and the more commonplace an element is, the more it influences the resulting parameters. Statistical regularities can capture some stylistic features, but what the model extracts from any given work is the probability of the following word or word-piece, not the work's expression itself.

Because LLMs do not reference the expressive nature of any underlying text, it is no surprise that LLMs "have not reproduced to the public a given work's creative elements, nor even one author's identifiable expressive style."[22] *Bartz*, 787 F. Supp. 3d at 1021. LLMs do not ordinarily store and regurgitate the expressive works in their corpus; they instead compose text based on statistical probabilities and inference. *See supra* Section I.C. Empirical perturbation studies—experiments in which researchers scramble word order so that each word appears just

[22] And, in any event, it is not clear that another's identifiable style is, in fact, copyrightable. *Bartz*, 787 F. Supp. 3d at 1021.

as often as before but loses its relationship to surrounding words—reinforce that conclusion: models' learned representations track token co-occurrence statistics and surrounding-context relationships, and destroying those relationships while preserving marginal token frequencies changes what the model learns.[23] That result shows that the model is learning distributional relationships, not retaining particular texts.[24] The memorization literature likewise finds that memorization is limited and non-uniform, *see supra* Section I.C; deduplication and other interventions measurably reduce extraction likelihood while leaving general language capability intact, which would not be expected if the model's capability depended on retaining the works themselves.[25] Again, analogies to dissimilar processes (like a "database" or "filesystem") are inapt and cannot substitute for a proper understanding of the technical underpinnings of the model. Those terms suggest a system that stores individual works in identifiable locations and retrieves those works on demand. By contrast, statistical next-token training encodes broad linguistic patterns in numerical parameters, and generation proceeds by producing a probability distribution for the next token and sampling from it.

News Plaintiffs' claim that training on "broad patterns of human language" is merely "shorthand" for distilling "copyrightable expression" is inaccurate.[26] When training pipelines favor well-formed text, that preference reflects function, not expressive value. *Amici* understand "quality" in a training pipeline to be a machine-usability criterion, not a judgment about creative or expressive merit. For example, preprocessing filters out gibberish and lorem ipsum, all-caps

[23] *See* Deqing Fu et al., *Convergent Evolution: How Different Language Models Learn Similar Number Representations*, arXiv:2604.20817, Aug. 17, 2026, at 7–8.

[24] *Id.*

[25] Dong, Lin, Belkin, Huerta & Vulić, *supra* note 15, at 2.

[26] News Pls.' Mem. of Law in Opp'n to Defs.' Mots. for Summ. J., Dkt. 2118 at 9.

text, text with a high symbol-to-word ratio, and duplicate documents. These filters exist because repetition and noise degrade training stability and model performance, not because the retained text is more creative.[27] An LLM cannot train usefully on gibberish because gibberish carries no reliable statistical regularities between tokens, whereas well-formed, grammatical prose supplies dense distributional structure—the unprotectable functional element the model extracts.[28] In this respect, LLM training resembles the use the Second Circuit upheld in *Authors Guild*. There, the court found fair use "because the secondary use transformatively provides valuable information about the original, rather than replicating protected expression in a manner that provides a meaningful substitute for the original." *Authors Guild*, 804 F.3d at 220. Training likewise draws statistical information *about* the works, namely the patterns of how language is structured and used, and does not reproduce their expression as a substitute for reading them. The relevant need is therefore for well-formed language at scale, which is why massive, diverse corpora—comprising over trillions of tokens drawn from billions of unique web documents—drive model capability, not the expression of any individual work. *See supra* Section I.A.

CONCLUSION

Amici respectfully submit these scientific observations to assist the Court in applying the relevant legal standards to its determination of fair use.

[27] *See* Li, Parker & Tenuto, *supra* note 13, at 9–10; Liu et al., *supra* note 7, at 8; Yann Dubois, *Overview of LLMs* (Stanford CS336 lecture, Sep. 15, 2025).

[28] *See* Dubois, *supra* note 27.

Dated: October 30, 2026
New York, New York

Respectfully submitted,

/s/ Candice J. Yandam Riviere

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CERTIFICATE OF COMPLIANCE

I, Candice J. Yandam Riviere, an attorney duly admitted to practice law in this Court, hereby certify that the foregoing brief complies with the word count limit because it contains 4,307 words excluding the parts exempted by Local Civil Rule 7.1(c). In preparing this certification, I have relied on the word count of the word-processing system used to prepare this brief.

Dated: October 30, 2026
New York, New York

/s/ Candice J. Yandam Riviere

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APPENDIX

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Mike Knoop

Last updated Feb. 8, 2025

- Co-founder, CEO Ndea – an intelligence science lab
- Co-founder, Board ARC Prize Foundation – a north star for AGI
- Co-founder, Board Zapier – automation for everyone
- Invested: Braintrust, Limitless, Julius, Cognition, Cartesia, After Thought, Climatix, New Theory, CTGT, Inception Labs, Sepal, Agemo
- Grew up in St. Louis, now SF Bay Area
- Email me: mikeknoop@gmail.com
- Twitter: @mikeknoop

Interviews

- 2025: Introducing Ndea (gradient dissent)
- 2024: Alma mater commencement speech (university of missouri)
- 2024: Why AGI needs new ideas, ARC Prize launch reactions (sequoia podcast)
- 2024: Announcing ARC Prize (dwarkesh podcast)
- 2024: Why open source AI progress matters (no priors podcast)
- 2023: Zapier's AI-powered future (sacra)
- 2023: Category creation, APIs, & AI architecture (this week in startups)
- 2023: How Zapier employees use AI (greg kamradt)
- 2022: Founder's guide to building a $5B company w/ little funding (traction conf)
- 2019: Running remote-first product and design teams (yc podcast)

Archive

- 2025: DeepSeek R1-Zero and R1 analysis
- 2024: OpenAI o1 analysis
- 2024: How to beat ARC-AGI
- 2024: How will AI Policy Impact AGI Progress?
- 2023: Co-founder mindset
- 2022: New product development cheatsheet
- 2019: Make 8BitDo controllers work with iOS
- 2016: Survey of Credit Card Forms
- 2011: Pioneer DVR harddrive recovery tools
- 2011: KnoopVsZombies — an HvZ engine

- 2007: Ticalc.org author profile, SafeGuard program

DANIEL LOWD

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Eugene, OR 97403

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INTERESTS

Machine learning and artificial intelligence, including adversarial machine learning, privacy, interpretable AI, and probabilistic and relational models.

EDUCATION

2003–2010: **University of Washington**, Seattle, WA
Ph.D. in Computer Science and Engineering, March 2010
M.S. in Computer Science and Engineering, June 2005
Advisor: Pedro Domingos.
Committee members: Jeff Bilmes, Marina Meila, and Mark S. Handcock.
Dissertation title: *Efficient Algorithms for Learning and Inference in Rich, Statistical Models.*

1999–2003: **Harvey Mudd College**, Claremont, CA.
B.S. in Mathematics/Computer Science with "High Honors."

PROFESSIONAL EXPERIENCE

September 2024 – Present: Professor, Department of Computer Science, University of Oregon.

September 2017 – September 2024: Associate Professor, Department of Computer and Information Science, University of Oregon.

June 2010 – September 2017: Assistant Professor, Department of Computer and Information Science, University of Oregon.

September 2009 – June 2010: Acting Assistant Professor, Department of Computer and Information Science, University of Oregon.

September 2003 – August 2009: Research assistant for Pedro Domingos, University of Washington. Developed faster machine learning algorithms, more flexible probabilistic models, and methods for learning models with efficient inference.

Summer 2008: Intern at SmartDesktop division of Pi Corporation, Seattle, WA.
Developed and evaluated automatic methods for desktop activity recognition.

Summer 2004: Intern at Microsoft Research with Christopher Meek in Redmond, WA.
Developed simple yet effective attacks against linear spam filters, testing filter robustness and promoting the development of more secure spam filters.

June 2002 – September 2003: Research assistant for Jon Herlocker, Oregon State University.
Conducted a third-party evaluation of prominent collaborative filtering algorithms. Funded by the NSF through the REU program.

Summer 2001: Intern at Green Hills Software in Santa Barbara, CA.
Invented and implemented a binary diff algorithm, reducing code update time by 90–97% for

embedded targets. Ported a linker from Solaris to vxWorks and reduced code size by 80% for use on JPL's Mars Expedition Rover. Ran automated compiler validations for R6K architecture and implemented appropriate fixes in library code.

Summer 2000: Intern at Adobe Systems in San Jose, CA.
Added XML support to Adobe Acrobat's Webcapture plug-in.

Summer 1999: Intern at Spyglass in Los Gatos, CA.
Assisted in the development of a Windows CE application for physical therapists.

SCHOLARSHIPS, HONORS, AND AWARDS

Best Poster Paper Award Nominee, EDM 2025
Area Chair Favorite Paper, COLING 2018
ICML 2016 Outstanding Reviewer Award (2016)
Army Research Office Young Investigator Award (2015)
Best Paper Award, DEXA Conference (2015)
Google Faculty Research Award (2013)
Microsoft Research Fellow, sponsored by Live Labs (2007–2008)
National Science Foundation Graduate Research Fellowship (2003–2006)

BOOKS

1. P. Domingos and D. Lowd, *Markov Logic: An Interface Layer for AI*, Morgan & Claypool. 2009. 155 pages.

BOOK CHAPTERS

2. S. Natarajan, J. Davis, K. Kersting, P. Domingos, and D. Lowd, "Statistical Relational Learning," in *An Introduction to Lifted Probabilistic Inference* (18 pages), edited by G. Van den Broeck, K. Kersting, S. Natarajan, and D. Poole, MIT Press, 2021.
3. P. Domingos, D. Lowd, S. Kok, H. Poon, M. Richardson and P. Singla, "Markov Logic: A Language and Algorithms for Link Mining," in *Link Mining: Models, Algorithms, and Applications* (pp. 135–161), edited by P. S. Yu, J. Han, and C. Faloutsos, Springer, 2010.
4. P. Domingos, D. Lowd, S. Kok, H. Poon, M. Richardson and P. Singla, "Just Add Weights: Markov Logic for the Semantic Web," in *Uncertainty Reasoning for the Semantic Web I* (pp. 1–25), edited by P. Costa, C. d'Amato, N. Fanizzi, K. B. Laskey, K. J. Laskey, T. Lukasiewicz, M. Nickles and M. Pool, Springer, 2008.
5. P. Domingos, S. Kok, D. Lowd, H. Poon, M. Richardson and P. Singla, "Markov Logic," in *Probabilistic Inductive Logic Programming* (pp. 92–117), edited by L. De Raedt, P. Frasconi, K. Kersting and S. Muggleton, Springer, 2008.

JOURNAL ARTICLES

6. Z. Hammoudeh and D. Lowd, "Training data influence analysis and estimation: A survey," in *Machine Learning Journal*, (pp. 2351–2403), vol.113, 2024.
7. J. Brophy, Z. Hammoudeh, and D. Lowd, "Adapting and Evaluating Influence-Estimation Methods for Gradient-Boosted Decision Trees," in the *Journal of Machine Learning Research* (pp. 1–48), vol.24, 2023.

8. P. Domingos and D. Lowd, "Unifying Logical and Statistical AI with Markov Logic," in *Communications of the ACM* (pp. 74–83), vol.62, no.7, 2019.

9. S. Jiang, D. Lowd, S. Kafle, and D. Dou, "Ontology Matching with Knowledge Rules," in *Transactions on Large-Scale Data- and Knowledge-Centered Systems* (pp. 75–95), vol.28, 2016.

10. D. Lowd and A. Rooshenas, "The Libra Toolkit for Probabilistic Models," in the *Journal of Machine Learning Research* (pp. 2459–2463), vol.16, 2015.

11. D. Lowd and J. Davis, "Improving Markov Network Structure Learning Using Decision Trees," in the *Journal of Machine Learning Research* (pp. 501–532), vol.15, 2014.

REFEREED CONFERENCE PUBLICATIONS

12. W. You and D. Lowd, "The Ultimate Cookbook for Invisible Poison: Crafting Subtle Clean-Label Text Backdoors with Style Attributes," in *IEEE Conference on Secure and Trustworthy Machine Learning (SaTML)*, (pp. 222–246), 2025.

13. Z. Hammoudeh and D. Lowd, "Provable Robustness Against a Union of L_0 Adversarial Attacks," in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2024.

14. W. You, Z. Hammoudeh, and D. Lowd. "Large Language Models Are Better Adversaries: Exploring Generative Clean-Label Backdoor Attacks Against Text Classifiers," in *Findings of the Association for Computational Linguistics: EMNLP 2023* (pp. 12499–12527), Singapore, 2023.

15. A. Baruwa, S. Sokolowski, J. Searcy, and D. Lowd. "Machine Learning to Define Anthropometric Landmarks for Relevant Product Design 2D Blueprint Measures," in *Proceedings of the Applied Human Factors and Ergonomics (AHFE) 2023 International Conference*, 2023.

16. Z. Hammoudeh and D. Lowd, "Reducing Certified Regression to Certified Classification for General Poisoning Attacks," in *IEEE Conference on Secure and Trustworthy Machine Learning (SaTML)*, 2023. (Acceptance rate: 26%.)

17. J. Brophy and D. Lowd, "Instance-Based Uncertainty Estimation for Gradient-Boosted Regression Trees," in *Advances in Neural Information Processing Systems 35 (NeurIPS)*, 2022. (Acceptance rate: 26%.)

18. Z. Hammoudeh and D. Lowd, "Identifying a Training-Set Attack's Target Using Renormalized Influence Estimation," in *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, (pp. 1367–1381), 2022. (Acceptance rate: 23%.)

19. J. Brophy and D. Lowd, "Machine unlearning for random forests," in *Proceedings of the International Conference on Machine Learning (ICML-21)*, (pp. 1092–1104), 2021. (Acceptance rate: 22%.)

20. Z. Hammoudeh and D. Lowd, "Learning from positive and unlabeled data with arbitrary positive shift," in *Advances in Neural Information Processing Systems 33 (NeurIPS)*, (pp. 13088–13099), 2020. (Acceptance rate: 20%.)

21. S. Jamshidi, Z. Hammoudeh, R. Durairajan, D. Lowd, R. Rejaie, and W. Willinger, "On the Practicality of Learning Models for Network Telemetry," in *Proceedings of the 4th Network Traffic Measurement and Analysis Conference (TMA 2020)*, Berlin, Germany (Virtual), 2020. (Acceptance rate: 33%.)

22. J. Ebrahimi, D. Lowd, and D. Dou, "On Adversarial Examples for Character-Level Neural Machine Translation," in *Proceedings of the 27th International Conference on Computational Linguistics (COLING 2018)*, (pp. 653–663), Santa Fe, New Mexico, USA, 2018. **Area Chair Favorite.** (Acceptance rate: 3.8% Area Chair Favorites; 37% overall.)
23. J. Ebrahimi, A. Rao, D. Lowd, and D. Dou, "HotFlip: White-Box Adversarial Examples for Text Classification," in *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (ACL 2018)* (short paper), (pp. 31–36), Melbourne, Australia, 2018. (Acceptance rate: 24%.)
24. A. Pouran Ben Veyseh, J. Ebrahimi, D. Dou, and D. Lowd, "A Temporal Attentional Model for Rumor Stance Classification," in *Proceedings of the 26th ACM International Conference on Information and Knowledge Management (CIKM)* (short paper), (pp. 2335–2338), Singapore, 2017. (Acceptance rate: 28% short papers.)
25. J. Ebrahimi, D. Dou, and D. Lowd, "A Joint Sentiment-Target-Stance Model for Stance Classification in Tweets," in *Proceedings of the 26th International Conference on Computational Linguistics (COLING 2016)* (pp. 2656–2665), 2016. (Acceptance rate: 32%.)
26. J. Ebrahimi, D. Dou, and D. Lowd, "Weakly Supervised Tweet Stance Classification by Relational Bootstrapping," in *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP 2016)* (pp. 1012–1017) (short paper), 2016. (Acceptance rate: 25%.)
27. H. Wang, D. Dou, and D. Lowd, "Ontology-based Deep Restricted Boltzmann Machine," in *Proceedings of the 27th International Conference on Database and Expert Systems Applications (DEXA 2016)* (pp. 431–445), Porto, Portugal, 2016.
28. A. Rooshenas and D. Lowd, "Discriminative Structure Learning of Arithmetic Circuits," in *Proceedings of the 19th International Conference on Artificial Intelligence and Statistics (AISTATS)* (pp. 1506–1514), Cadiz, Spain, 2016. (Acceptance rate: 31%.)
29. S. Jiang, D. Lowd, and D. Dou, "A Probabilistic Approach to Knowledge Translation," in *Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16)* (pp. 1716–1722), Phoenix, AZ, USA, 2016. (Acceptance rate: 26%.)
30. S. Jiang, D. Lowd, and D. Dou, "Ontology Matching with Knowledge Rules," in *Proceedings of the 26th International Conference on Database and Expert Systems Applications (DEXA 2015)* (pp. 94–108), Valencia, Spain, 2015. **Best Paper Award.**
31. R. Motamedi, R. Rejaie, W. Willinger, D. Lowd, and R. Gonzalez, "Inferring Coarse Views of Connectivity in Very Large Graphs," in *Proceedings of the ACM Conference on Online Social Networks (COSN)* (pp. 191–202), Dublin, Ireland, 2014. (Acceptance rate: 16%.)
32. M. Torkamani and D. Lowd, "On Robustness and Regularization of Structural Support Vector Machines," in *Proceedings of the 31st International Conference on Machine Learning (ICML)* (pp. 577–585), Beijing, China, 2014. (Acceptance rate: 25%.)
33. A. Rooshenas and D. Lowd, "Learning Sum-Product Networks with Direct and Indirect Interactions," in *Proceedings of the 31st International Conference on Machine Learning (ICML)* (pp. 710–718), Beijing, China, 2014. (Acceptance rate: 25%.)
34. A. Bates, R. Leonard, H. Pruse, D. Lowd, and K. Butler, "Leveraging USB to Establish Host Identity Using Commodity Devices," in *Proceedings of the 21st ISOC Network and Distributed System Security Symposium (NDSS)* (14 pages), San Diego, CA, USA, 2014. (Acceptance rate: 19%.)

35. D. Lowd and A. Rooshenas, "Learning Markov Networks with Arithmetic Circuits," in *Sixteenth International Conference on Artificial Intelligence and Statistics (AISTATS)* (pp. 406–414), Scottsdale, AZ, USA, 2013. (Acceptance rate: 34%.)
36. M. Torkamani and D. Lowd, "Convex Adversarial Collective Classification," in *Proceedings of the 30th International Conference on Machine Learning (ICML)* (pp. 642–650), Atlanta, GA, USA, 2013. (Oral. Acceptance rate: 12% for oral presentations.)
37. S. Jiang, D. Lowd, and D. Dou, "Learning to Refine an Automatically Extracted Knowledge Base using Markov Logic," in *Proceedings of the IEEE International Conference on Data Mining (ICDM)* (pp. 912–917), Brussels, Belgium, 2012. (Acceptance rate: 20%.)
38. D. Lowd, "Closed-Form Learning of Markov Networks from Dependency Networks," in *Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence (UAI-12)* (pp. 533–542), Catalina Island, CA, 2012. (Spotlight. Acceptance rate: 32% overall; 14% with a talk or spotlight.)
39. D. Lowd and A. Shamaei, "Mean Field Inference in Dependency Networks: An Empirical Study," in *Proceedings of the 25th Conference on Artificial Intelligence (AAAI-11)* (pp. 404–410), San Francisco, CA, 2011. (Acceptance rate: 25%.)
40. D. Lowd and P. Domingos, "Approximate Inference by Compilation to Arithmetic Circuits," in *Advances in Neural Information Processing Systems (NIPS) 24* (pp. 1477–1485), Vancouver, BC, 2010. (Acceptance rate: 24%.)
41. D. Lowd and J. Davis, "Learning Markov Network Structure with Decision Trees," in *Proceedings of the 10th IEEE International Conference on Data Mining (ICDM)* (pp. 334–343), Sydney, Australia, 2010. (Full paper. Acceptance rate: 19% overall; 9% for full papers.)
42. S. Natarajan, T. Khot, D. Lowd, K. Kersting, P. Tadepalli and J. Shavlik, "Exploiting Causal Independence in Markov Logic Networks: Combining Undirected and Directed Models," in *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)* (pp. 434–450), Barcelona, Spain, 2010. (Acceptance rate: 16%.)
43. D. Lowd and N. Kushmerick, "Using Salience to Segment Desktop Activity into Projects," in *Proceedings of the Thirteenth International Conference on Intelligent User Interfaces* (pp. 463–468), Sanibel Island, Florida, 2009. (Short paper. Acceptance rate: 31%.)
44. D. Lowd and P. Domingos, "Learning Arithmetic Circuits," in *Proceedings of the Twenty-Fourth Conference on Uncertainty in Artificial Intelligence* (pp. 383–392), Helsinki, Finland, 2008.
45. D. Lowd and P. Domingos, "Efficient Weight Learning for Markov Logic Networks," in *Proceedings of the Eleventh European Conference on Principles and Practice of Knowledge Discovery in Databases* (pp. 200–211), Warsaw, Poland, 2007.
46. D. Lowd and P. Domingos, "Recursive Random Fields," in *Proceedings of the Twentieth International Joint Conference on Artificial Intelligence* (pp. 950–955), Hyderabad, India, 2007. (Oral presentation. Acceptance rate: 16%.)
47. D. Lowd and P. Domingos, "Naive Bayes Models for Probability Estimation," in *Proceedings of the Twenty-Second International Conference on Machine Learning* (pp. 529–536), Bonn, Germany, 2005. (Acceptance rate: 27%.)
48. D. Lowd and C. Meek, "Good Word Attacks on Statistical Spam Filters," in *Proceedings of the Second Conference on Email and Anti-Spam* (8 pages), Palo Alto, CA, 2005.

49. D. Lowd and C. Meek, "Adversarial Learning," in *Proceedings of the Eleventh ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (pp. 641–647), Chicago, IL, 2005. (Acceptance rate: 21.2%.)

REFEREED WORKSHOP AND POSTER PUBLICATIONS

50. A. Kabir and D. Lowd, "On the Practicality of Differential Privacy for Knowledge Tracing," in *Proceedings of the 18th International Conference on Educational Data Mining (EDM 2025)* (pp. 619–624), Palermo, Italy, 2025. (Poster paper.) **Nominee for Best Poster Paper Award.**
51. W. You and D. Lowd, "The Ultimate Cookbook for Invisible Poison: Crafting Subtle Clean-Label Text Backdoors with Style Attributes," in *The Third Workshop on New Frontiers in Adversarial Machine Learning (AdvML-Frontiers) at NeurIPS 2024*, 2024.
52. J. Heibel and D. Lowd, "MaPPing Your Model: Assessing the Impact of Adversarial Attacks on LLM-based Programming Assistants," in *ICML 2024 Workshop on Trustworthy Multimodal Foundation Models and AI Agents (TiFA)*, 2024.
53. W. You, Z. Hammoudeh, and D. Lowd, "Large Language Models Are Better Adversaries: Exploring Generative Clean-Label Backdoor Attacks Against Text Classifiers," in *The Second Workshop on New Frontiers in Adversarial Machine Learning*, 2023.
54. Z. Hammoudeh and D. Lowd, "Feature Partition Aggregation: A Fast Certified Defense Against a Union of ℓ_0 Attacks," in *The Second Workshop on New Frontiers in Adversarial Machine Learning*, 2023.
55. J. Brophy and D. Lowd, "Instance-Based Uncertainty Estimation for Gradient-Boosted Regression Trees," in *ICML 2022 Workshop on Distribution-Free Uncertainty Quantification (DFUQ)*, 2022.
56. W. You and D. Lowd, "Towards Stronger Adversarial Baselines Through Human-AI Collaboration," in *Proceedings of NLP Power! The First Workshop on Efficient Benchmarking in NLP*, (pp. 11–20), 2022.
57. Z. Xie, J. Brophy, A. Noack, W. You, K. Asthana, C. Perkins, S. Reis, Z. Hammoudeh, D. Lowd, and S. Singh, "What Models Know About Their Attackers: Deriving Attacker Information From Latent Representations," in *Proceedings of the Fourth BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP*, (pp. 69–78), 2021.
58. Z. Hammoudeh and D. Lowd, "Simple, Attack-Agnostic Defense Against Targeted Training Set Attacks Using Cosine Similarity," in *ICML Workshop on Uncertainty and Robustness in Deep Learning* (6 pages plus appendix), 2021.
59. J. Brophy and D. Lowd, "DART: Data Addition and Removal Trees," in *The Second AAAI Workshop on Privacy-Preserving Artificial Intelligence (PPAI-21)*, 2021. (Spotlight.)
60. J. Brophy and D. Lowd, "TREX: Tree-Ensemble Representer-Point Explanations," in *ICML 2020 Workshop on Extending Explainable AI Beyond Deep Models and Classifiers (XXAI)*, 2020.
61. J. Brophy and D. Lowd, "EGGS: A Flexible Approach to Relational Modeling of Social Network Spam," in the *Ninth International Workshop on Statistical Relational AI (StarAI 2020)* (10 pages), New York, NY, 2020.

62. J. Brophy and D. Lowd, "Collective Classification of Social Network Spam," in the *AAAI-17 Workshop on Artificial Intelligence for Cyber Security (AICS2017)* (pp. 162–169), San Francisco, CA, 2017.
63. I. Burago and D. Lowd, "Automated Attacks on Compression-Based Classifiers," in *Proceedings of the 2015 ACM Workshop on Artificial Intelligence and Security (AISec)* (pp. 69–80), Denver, CO, 2015.
64. S. Jiang, D. Lowd, and D. Dou, "A Probabilistic Approach to Knowledge Translation," in *Fifth International Workshop on Statistical Relational AI (StarAI 2015)* (7 pages), 2015.
65. S. Jiang, D. Lowd, and D. Dou, "Ontology Matching with Knowledge Rules," in *Fifth International Workshop on Statistical Relational AI (StarAI 2015)* (7 pages), 2015.
66. M. Torkamani and D. Lowd, "Applying Dropout Regularization to Support Vector Machines," in *NIPS 2014 Workshop on Perturbation, Optimization, and Statistics*, Montreal, Quebec, Canada (5 pages), 2014.
67. D. Lowd, B. Lessley, and M. De Raj, "Towards Adversarial Reasoning in Statistical Relational Domains," in *AAAI-14 Workshop on Statistical Relational AI (StarAI 2014)* (pp. 57–59), 2014.
68. M. Torkamani and D. Lowd, "On Robustness and Regularization of Structural Support Vector Machines," in *NIPS 2013 Workshop on Perturbation, Optimization, and Statistics* (5 pages), Stateline, NV, USA, 2013.
69. A. Rooshenas and D. Lowd, "Learning Sum-Product Networks with Direct and Indirect Interactions," in *NIPS 2013 Workshop on Deep Learning* (7 pages), Stateline, NV, USA, 2013.
70. D. Stevens and D. Lowd, "On the Hardness of Evading Combinations of Linear Classifiers," in *Proceedings of the 2013 ACM Workshop on Artificial Intelligence and Security (AISec)* (pp. 77–86), Berlin, Germany, 2013.
71. A. Rooshenas and D. Lowd, "Learning Tractable Graphical Models Using Mixtures of Arithmetic Circuits," in *Late-Breaking Developments in the Field of Artificial Intelligence: Papers Presented at the Twenty-Seventh AAAI Conference on Artificial Intelligence* (pp. 104–106), Bellevue, WA, USA, 2013.
72. D. Lowd and A. Rooshenas, "Learning Markov Networks with Arithmetic Circuits," in *ICML-13 Workshop on Inferning* (6 pages), Atlanta, GA, USA, 2013.
73. M. Torkamani and D. Lowd, "Convex Adversarial Collective Classification," in *UAI-12 Workshop on Statistical Relational AI* (8 pages), Catalina Island, CA, 2012.
74. S. Jiang, D. Lowd, and D. Dou, "Using Markov Logic to Refine an Automatically Extracted Knowledge Base," in *UAI-12 Workshop on Statistical Relational AI* (8 pages), Catalina Island, CA, 2012.
75. S. Natarajan, T. Khot, D. Lowd, P. Tadepalli, K. Kersting, and J. Shavlik, "Exploiting Causal Independence in Markov Logic Networks: Combining Undirected and Directed Models," in *AAAI-10 Workshop on Statistical Relational AI* (6 pages), Atlanta, Georgia, 2010.
76. D. Lowd, C. Meek and P. Domingos, "Foundations of Adversarial Machine Learning," in *NIPS-2007 Workshop on Machine Learning in Adversarial Environments for Computer Security* (2 pages), Vancouver, Canada, 2007.
77. D. Lowd and P. Domingos, "Recursive Random Fields," in *Proceedings of the ICML-2006 Workshop on Open Problems in Statistical Relational Learning* (8 pages), Pittsburgh, PA, 2006.

INVITED PAPERS

78. P. Domingos, D. Lowd, S. Kok, A. Nath, H. Poon, and P. Singla, "Unifying Logical and Statistical AI," in *ACM/IEEE Symposium on Logic in Computer Science* (pp. 1–11), New York City, NY, 2016.

GENERAL AUDIENCE ARTICLES

79. D. Lowd, "Can Facebook use AI to fight online abuse?" in *The Conversation*, June 12, 2018. Reprinted by Scientific American, Salon, the Seattle P.I., and many other venues. Available online at: `https://theconversation.com/can-facebook-use-ai-to-fight-online-abuse-95203`.

PRESS COVERAGE

- Quoted in news article about AI and mental health: "Will AI replace therapists?" in *Newsweek*, January 8, 2025. `https://www.newsweek.com/will-ai-replace-therapists-chatgpt-mental-health-usa-2010934`
- Live broadcast appearance on navigating AI in 2025, *Global News*, January 4, 2025. `https://www.youtube.com/watch?v=LP0xNwilLeY`
- Quoted in news article about AI chatbot safety for children: "Are AI Chatbots Safe for Children? Experts Weigh in After Teen's Suicide" in *Newsweek*, November 13, 2024. `https://www.newsweek.com/are-ai-chatbots-safe-children-experts-weigh-after-teens-suicide-1983698`
- Work covered and public talk announced: "Science talk takes on 'fake news'" in *The Nugget Newspaper*, April 16, 2019. `https://nuggetnews.com/MobileContent/Education/Education/Article/Science-talk-takes-on-fake-news-/8/8/28134`
- Quoted in news article about filtering violence online: "Why AI is still terrible at spotting violence online" in *CNN Business*, March 18, 2019. `https://www.cnn.com/2019/03/16/tech/ai-video-spotting-terror-violence-new-zealand/index.html`
- Quoted in news article about OpenAI: "Nonprofit OpenAI looks at the bill to craft a Holy Grail AGI, gulps, spawns commercial arm to bag investors' mega-bucks" in *The Register*, March 13, 2019. `https://www.theregister.co.uk/2019/03/13/openai_nonprofit_status/`.
- Work covered in news article: "Potato, potato. Toma6to, I'm going to kill you... How a typo can turn an AI translator against us" in *The Register*, June 28, 2018. `https://www.theregister.co.uk/2018/06/28/machine_translation_vulnerable/`.
- Quoted in news article about adversarial artificial intelligence: "The tiny changes that can cause AI to fail" in *BBC Future Now*, April 11, 2017. `https://www.bbc.com/future/article/20170410-how-to-fool-artificial-intelligence`

SOFTWARE RELEASED

Libra: Machine learning toolkit for Bayesian networks, Markov networks, and arithmetic circuits
`http://libra.cs.uoregon.edu`

(Published in the Journal of Machine Learning Research Machine Learning Open-Source Software (JMLR MLOSS).)

Alchemy: Algorithms for statistical relational AI
`http://alchemy.cs.washington.edu`
(Along with various other contributors.)

NBE: A Bayesian learner with very fast inference

CoFE: COllaborative Filtering Engine
(Along with various other contributors. No longer supported.)

INVITED TALKS

"The Manchurian Classifier: Invisible Triggers and Vulnerabilities in Text Models"
Oregon State University AI Seminar, Corvallis, OR, March, 2025.

"Training Data Influence Analysis and Estimation"
Machine Learning for Simulation Science (MLS), Institute for Artificial Intelligence, University of Stuttgart, Germany (remote), February, 2023.

"When Can We Trust Artificial Intelligence?"
Sisters Middle School, Sisters, OR, April, 2019.

"Algorithms and Artificial Intelligence: Science takes on fake news"
Sisters Science Club, Sisters, OR, April, 2019.

"When Can We Trust Artificial Intelligence?"
University of Oregon, Machine Learning Meetup, February, 2019.

"When Can We Trust Artificial Intelligence?"
QuackChat, Eugene, OR, January, 2019.

"A Whirlwind Tour of Machine Learning"
University of Oregon, ITS/HET Seminar, October, 2017.

"Adversarial Statistical Relational AI"
Sixth International Workshop on Statistical Relational AI (StarAI 2016), July, 2016.

"Adversarial Machine Learning in Relational Domains"
University of Texas Dallas (UTDallas), March, 2016.

"Adversarial Machine Learning in Relational Domains"
University of Utah, March, 2016.

"Adversarial Machine Learning in Relational Domains"
University of Maryland Baltimore County (UMBC), March, 2016.

"Adversarial Machine Learning in Relational Domains"
Tufts University, February, 2016.

"Adversarial Machine Learning in Relational Domains"
Michigan State University, February, 2016.

"Structure Learning for Sum-Product Networks"
Oregon State University, October, 2015.

"Structure Learning for Sum-Product Networks"
University of California Santa Cruz, November, 2014.

"Adversarial Machine Learning in Relational Domains"
LinkedIn, November, 2014.

"Adversarial Machine Learning in Relational Domains"
United Technologies Research Center Berkeley, November, 2014.

"Structure Learning for Sum-Product Networks"
United Technologies Research Center New Haven, November, 2014.

"Adversarial Machine Learning in Relational Domains"
Amazon.com, Inc., October, 2014.

"Machine Learning with Evasive Adversaries"
University of Washington. September, 2014.

"Learning Tractable Probabilistic Models" (with Pedro Domingos)
Tutorial for the 2014 Conference on Uncertainty in Artificial Intelligence (UAI 2014). July, 2014.

"Using Dependency Networks To Learn Markov Networks"
University of Wisconsin-Madison. October, 2013.

"Learning Relational Classifiers for Adversarial Domains"
University of Indiana-Bloomington. October, 2013.

"Learning Relational Classifiers for Adversarial Domains"
SRI International. October, 2013.

"Better Learning and Inference with Dependency Networks"
University of Maryland, College Park. January, 2013.

"Learning Relational Classifiers for Adversarial Domains"
LinkedIn. January, 2013.

"Convex Adversarial Collective Classification"
SRI International. January, 2013.

"Convex Adversarial Collective Classification"
Dagstuhl Perspectives Workshop on Machine Learning Methods for Computer Security. October, 2012.

"Convex Adversarial Collective Classification"
University of Washington. September, 2012.

"Toward Adversarial Collective Classification"
2nd ARO Workshop on Moving Target Defense, George Mason University. October, 2011.

"Better Learning and Inference with Dependency Networks"
University of Washington. September, 2011.

"Mean Field Inference in Dependency Networks: An Empirical Study"
Oregon State University. July, 2011.

"Inference Complexity As Learning Bias"
Oregon State University. January, 2010.

"Adversarial Machine Learning"
Portland State University. November, 2009.

"Markov Logic: Representation, Inference and Learning"
University of Michigan. March, 2009.

"Markov Logic: Representation, Inference and Learning"
University of Oregon. April, 2009.

"Foundations of Adversarial Machine Learning"
University of Cagliari. July, 2008.

"Adversarial Learning"
Oregon State University. June, 2006.

GRANTS AND OTHER FUNDING

6/2023 – 5/2028: *INVITE: Inclusive and Innovative Intelligent Technologies for Education*, National Science Foundation (NSF), $1,109,778 (Oregon's share of a collaborative grant led by UIUC); total budget: $19,562,906.

10/2020 – 12/2024: Reverse Engineering Adversarially Constructed Text (REACT), Defense Advanced Research Projects Agency (DARPA), $1,555,853 (PI with UO as lead institution and UC Irvine as subcontractor).

2/2020 – 2/2021: *Relating learning and intelligence across artificial and human agents*, 2019 Data Science Initiative Seed Funding convening award, University of Oregon, $10,000 (co-PI with Ben Hutchinson).

6/2016 – 6/2020: *AMIA: Automated Media Integrity Assessment*, Defense Advanced Research Projects Agency, Media Forensics (MediFor) Program (DARPA-BAA-15-58), Technical Area TA2, $807,000 (subcontract from SRI International; total budget: $9,490,000).

6/2015 – 6/2018: *Inferring Trustworthiness and Deceit with Adversarial Relational Models*, Army Research Office, Young Investigator Program, $357,573.

9/2014 – 8/2016: *EAGER: Machine Learning to Combat Adversarial Attacks*, National Science Foundation, $104,997.

9/2013 – 8/2014: *Learning Tractable Graphical Models with Latent Variables*, Google Faculty Research Award, $56,856.

5/2013 – 2/2016: *Understanding the Mechanism of Social Network Influence in Health Outcomes through Multidimensional and Semantic Data Mining Approaches*, National Institutes of Health, $1,500,000 (co-PI, with Dejing Dou and 6 others).

7/2011 – 6/2015: *Statistical Knowledge Translation and Knowledge Integration Using Markov Logic*, National Science Foundation, $495,000 (co-PI, with Dejing Dou).

1/2011 – 6/2014: *A Unified Approach to Abductive Inference*, Multidisciplinary University Research Initiative, Army Research Office, $232,998 (subcontract from UW).

COURSES TAUGHT

CS 670: Data Science. Spring 2021, Spring 2022, Winter 2023, Spring 2024, Winter 2025.

CS 610pm: Probabilistic Methods for AI. Spring 2012.

CS 610: Welcome to Grad School. Fall 2021–2022, 2024. (2-credit seminar.)

CS 610: Teaching Effectiveness / Welcome to Grad School. Fall 2023. (2-credit seminar, co-taught.)

CS 473/573: Probabilistic Methods for AI. Winter 2010, Fall 2010, Spring 2013–2018, Spring 2025.

CS 472/572: Machine Learning. Winter 2013, Winter 2015–2018, Winter 2020.

CS 471/571: Introduction to Artificial Intelligence. Fall 2012, Fall 2016.

CS 413/513: Advanced Data Structures. Spring 2010, Fall 2011.

CS 399: Probability and Statistics for Computer Science. Fall 2017.

CS 313: Intermediate Data Structures. Winter 2014, Fall 2015, Fall 2019–2024.

CS 211: Computer Science II. Winter 2011, Spring 2011, Winter 2012.

STUDENTS

Ph.D. advisor (graduated)

Wencong You (Amazon)
Dissertation title: *The Dual Game of Clean-Label Backdoor Attacks and Defenses in NLP.*
Spring 2025.

Zayd Hammoudeh
Dissertation title: *Certified and Forensic Defenses Against Poisoning and Backdoor Attacks.*
Fall 2023.

Jonathan Brophy
Dissertation title: *Understanding and Adapting Tree Ensembles: A Training Data Perspective.*
Fall 2022.

Javid Ebrahimi (Visa) (co-advised with Dejing Dou)
Dissertation title: *Robustness of Neural Networks for Discrete Input: An Adversarial Perspective.*
Fall 2018.

Amirmohammad Rooshenas (University of Massachusetts, Amherst)
Dissertation title: *Learning Tractable Graphical Models.*
Winter 2017.

MohamadAli Torkamani (Cambia)
Dissertation title: *Robust Large Margin Approaches for Machine Learning in Adversarial Settings.*
Summer 2016.

Shangpu Jiang (Google) (co-advised with Dejing Dou)
Dissertation title: *Knowledge Base Refinement and Knowledge Translation with Markov Logic Networks.*
Fall 2015.

Ph.D. advisor (current)

Anika Nahian Binte Kabir
Utkarsh Sahu

M.S. thesis advisor (graduated)

Bharath Kumar Nachenahalli Bhuthegowda
Thesis title: *Methods for Analyzing the Evolution of Email Spam.* Summer 2018.

Jonathan Brophy (University of Oregon)
Thesis title: *Collective Classification of Social Network Spam.* Spring 2017.

Igor Burago (University of California Irvine)
Thesis title: *Automated Attacks on Compression-Based Classifiers.* Spring 2014.

Arash Shamaei (Oregon State University)
Thesis title: *Fast Inference Algorithms in Dependency Networks.* Summer 2011.

B.S. thesis advisor (graduated)

Clio Tsao
Thesis title: *Machine Learning, Machine Bias: A Systematic Survey on ML-Based Flood Model Prediction.* November 2025.

Sam Nelson
Thesis title: *Predicting SoundCloud Spammers.* Spring 2016.

PROFESSIONAL SERVICE

Editorial Board:

Journal of Machine Learning Research (JMLR), Editorial Board, 2020–Present
Springer Data Mining and Knowledge Discovery (DMKD), Editorial Board, 2019–2021
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Associate Editor, 2018–2020
ECML PKDD 2018 Journal Track, Guest Editorial Board, 2018

Associate Program Chair:

AAAI Conference on Artificial Intelligence (AAAI) 2023

Workshop Program Co-Chair:

AAAI Conference on Artificial Intelligence (AAAI) 2015, 2016

Proceedings Chair:

Conference on Uncertainty in Artificial Intelligence (UAI) 2014, 2015

Workshop Co-Chair:

ICML 2019 3rd Workshop on Tractable Probabilistic Modeling
IJCAI-ECAI-ICML 2018 Workshop on Tractable Probabilistic Models
New Perspectives for Relational Learning, Banff International Research Station, April 2015
ICML 2014 Workshop on Learning, Security and Privacy
ICML 2014 Workshop on Learning Tractable Probabilistic Models

Program Committees:

International Conference on Learning Representations (ICLR) 2018, 2019;
International Joint Conference on Artificial Intelligence (IJCAI) 2011, 2013, 2017; 2015–2016, 2018–2019, 2022 (Senior Program Committee)
AAAI Conference on Artificial Intelligence (AAAI) 2006, 2010–2015; 2017, 2019–2020 (Senior Program Committee), 2024
Neural Information Processing Systems (NeurIPS) 2006, 2012–2018 (Reviewer),

2020, 2024, 2026 (Area Chair), 2022–2023, 2025 (Area Chair, Datasets & Benchmarks)
ACM Conference on Computer and Communications Security (CCS) 2025 (ML & Security)
Uncertainty in Artificial Intelligence (UAI) 2010–2018
International Conference on Machine Learning (ICML) 2010–2014,
2016 **(Outstanding Reviewer Award)**, 2017, 2019 (Area Chair),
2020 (Expert Reviewer)
International Conference on Artificial Intelligence and Statistics (AISTATS) 2012,
2013, 2017, 2019
Conference on Decision and Game Theory for Security (GameSec) 2019
ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2011,
2015–2016
ECML-PKDD 2012
Asian Conference on Machine Learning (ACML) 2014
ACM Workshop on Artificial Intelligence and Security (AISec) 2013–2016, 2018, 2019, 2022
AAAI-16 Workshop on Artificial Intelligence for Cyber Security (AICS2016)
Workshop on Statistical Relational AI (StarAI) 2013–2018
ICML Workshop on Structured Learning (SLG) 2013
ICML Workshop on Statistical Relational Learning 2012
AAAI Nectar 2011
ECML/PKDD Workshop on Privacy and Security issues in Data Mining
and Machine Learning, 2010

Journal Reviewer:

Journal of Machine Learning Research (JMLR)
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
Machine Learning Journal (MLJ)
Journal of Artificial Intelligence Research (JAIR)
Artificial Intelligence Journal (AIJ)
Data Mining and Knowledge Discovery (DMKD) journal
Transactions on Dependable and Secure Computing (TDSC)
IEEE Security & Privacy
ACM SIGKDD Explorations
Journal of Systems and Software
International Journal of Pattern Recognition and Artificial Intelligence

Conference Reviewer:

International Conference on Machine Learning (ICML) 2008
ACM Conference on Electronic Commerce (EC) 2006

Other:

AI Curriculum Task Force, 2026
CAS Launch Committee Convener, 2024–2025
DEI Committee Chair, 2022–2025
UO School of Computer and Data Science (SCDS) Strategic Implementation Team, 2023
UO School of Computer and Data Science (SCDS) Planning Committee, 2022
Hiring committee: University of Oregon CIO, 2022
Hiring committee, 2021–2022 biomedical data science search
Ripple Fellowship Committee (2022)
Director of Graduate Studies, Dept. of Computer Science (2019–2021)
Member of Oregon's Artificial Intelligence Taskforce Education Sub-Committee, 2020

Dr. Douglas Craig Schmidt

Dean of Computing, Data Sciences & Physics
William & Mary
Williamsburg, VA 23185

douglas.c.schmidt@wm.edu
(TEL) 615-294-9573
(WEB) www.cs.wm.edu/~dcschmidt

Educational Background

- **Ph.D. Computer Science**, summer 1994, University of California, Irvine

  Dissertation: "An Object-Oriented Framework for Experimenting with Alternative Process Architectures for Parallelizing Communication Subsystems."

  Co-advisors: Dr. Tatsuya Suda and Dr. Richard W. Selby.

- **M.S. Computer Science**, summer 1990, University of California, Irvine, specializing in software engineering.

- **M.A. Sociology**, summer 1986, William & Mary, Williamsburg, Virginia Thesis: "A Statistical Analysis of University Resource Allocation Policies."

  Advisor: Dr. Michael A. Faia.

- **B.A. Sociology**, summer 1984, William & Mary, Williamsburg, Virginia.

Professional Experience

- **Academic Positions**

1. **1/25 – present: Dean of the School of Computing, Data Sciences, and Physics at William & Mary.** Report to the Provost and responsible for (1) uniting the school's four areas (computer science, data science, applied science and physics) into a cohesive academic unit and growing their research, grant funding and doctoral program enrollment, (2) establishing a vision with strategic objectives to ensure the school becomes nationally known as an inclusive and innovative leader in teaching and research, and (3) supporting faculty in their research, teaching and service work; leading fundraising efforts and the financial management of the school; and building or strengthening its strategic partnerships.

2. **2/17 – 4/24: Cornelius Vanderbilt Professor of Engineering at Vanderbilt University.** Received an endowed chair in recognition of my scholarship, intellect, and leadership in the field of computer science and computer engineering.

3. **1/03 – 4/24: Full Professor with tenure at Vanderbilt University**. Conducted research on patterns, optimizations, and experimental analysis of advanced generative software techniques that facilitate the development of distributed real-time and embedded middleware and model driven architectures, as well as prompt engineering and prompt patterns for large language models in the Department of Computer Science at Vanderbilt University.

4. **7/1/22 – 4/24: Associate Chair of Computer Science at Vanderbilt University.** Provide intellectual leadership within the CS department. Coordinate with CS Chair to assist in CS and CompE curriculum development and course staffing. Assist the faculty in building industry and federal programs for CS. Assist the Chair in mentoring junior CS faculty. Assist the EECS Chair in improving the ranking of the CS programs. Assist the Chair in increasing the quality, number, and online offerings of undergraduate and graduate student applications to the CS programs.

5. **7/1/18 – 6/30/22: Associate Provost of Research Development and Technologies at Vanderbilt University**. Develop cohesive and sustainable information technology (IT) services to advance research and scholarship across Vanderbilt's ten schools and colleges; develop scalable storage and processing solutions by leveraging on-campus and cloud data storage services, as well as creating big data research cores and core-related services; and implement NIST 800-171 compliant IT services.

6. **8/1/18 – 6/30/22: Co-Director of the Data Science Institute at Vanderbilt University.** Facilitate highly innovative research and education initiatives that build on Vanderbilt University's current strengths, promote new collaborations, and establish a cohesive institutional framework that embraces Vanderbilt's diverse campus, while establishing the university as a leader in data

science research and education.

7. **02/16 – 7/31/18: Associate Chair of Electrical Engineering and Computer Science (EECS) at Vanderbilt University**. Provide intellectual leadership within the EECS department. Coordinate with EECS Chair to assist in EE, CS, and CompE curriculum development and course staffing. Assist the faculty in building industry and federal programs for EECS. Assist the Chair in mentoring junior EECS faculty. Assist the EECS Chair in improving the ranking of the EECS programs. Assist the Chair in increasing the quality and number of undergraduate and graduate student applications to the EECS programs.

8. **12/04 – 1/16: Associate Chair of Computer Science and Engineering at Vanderbilt University**. Provide intellectual leadership within the CS program. Coordinate with EECS Chair to assist in CS and CompE (CS&E) curriculum development and course staffing. Assist the faculty in building industry and federal programs centered in CS&E and IT for EECS. Assist the Chair in mentoring junior CS&E faculty. Assist the EECS Chair in improving the ranking of the CS&E programs. Assist the Chair in increasing the quality and number of undergraduate and graduate student applications to the CS&E programs.

9. **7/11 – 7/13: Adjunct Professor of Software Engineering** in the Institute for Software Research in the School of Computer Science at Carnegie Mellon University.

10. **6/07 – 8/07: Visiting Professor at Trinity College Dublin.** Worked with Professor Vinny Cahill and the Distributed Systems Group at Trinity College on topics pertaining to service-oriented architectures and autonomic computing.

11. **8/99 – 2002: Associate Professor with tenure at University of California, Irvine.** Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Engineering at the University of California, Irvine.

12. **6/99 – 8/99: Associate Professor with tenure at Washington University, St. Louis.** Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.

13. **6/98 – 6/99: Associate Professor without tenure (early promotion) at Washington University, St. Louis**. Conducted research on patterns, implementation, and experimental analysis of object-oriented techniques that facilitate the development of high-performance, distributed real-time and embedded computing systems on parallel processing platforms running over high-speed networks and embedded system interconnects in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.

14. **8/94 – 6/98: Assistant Professor at Washington University, St. Louis**. Conducted research on object-oriented patterns and techniques for developing highly extensible, high-performance communication frameworks in the Department of Computer Science and the Department of Radiology at Washington University in St. Louis.

15. **3/91 – 8/94: Research Assistant at University of California, Irvine**. Developed object-oriented frameworks for multi-processor-based communication subsystems with Professor Tatsuya Suda at the University of California, Irvine.

16. **8/88 – 3/91: Research Assistant at University of California, Irvine**. Devised measurement-guided software development techniques for large-scale software systems with Professor Richard Selby at the University of California, Irvine.

17. **6/88 – 8/88: Research Assistant at University of California, Irvine**. Studied the impact of computing on end-users in forty U.S. city governments with Dr. John King and the URBIS project at the Public Policy Research Organization, University of California, Irvine.

18. **9/86 – 5/88: Teaching Assistant at University of California, Irvine**. Developed programming assignments, grading tools, and led recitation sessions for several undergraduate Computer Science courses at the University of California, Irvine.

19. **1/85 – 8/86: Research Assistant at William & Mary**. Examined university resource allocation policies via statistical analysis under the direction of Dr. Michael Faia at the William & Mary, Williamsburg, Virginia.

- **Government and Government-Adjacent Positions**

1. **2/25 – present: Visiting Scientist at Carnegie Mellon University's Software Engineering Institute (SEI).** Assist the SEI Software Solutions Division (SSD) in formulating SSD's technology strategy for R&D projects and external relationships by aligning the expertise of the SSD technical staff to identify and respond to the needs of government sponsors, and partners and help SSD shape future innovations in complex software-reliant systems, particularly related to generative AI.
2. **5/24 – 1/25: Director of Operational Test and Evaluation (DOT&E).** Reported to the Secretary of Defense and Congress and was responsible for assessing the effectiveness, suitability, survivability, and (when necessary) lethality of United States military systems.
3. **1/12 – 4/24: Visiting Scientist at Carnegie Mellon University's Software Engineering Institute (SEI).** Assist the SEI Director's Office in formulating the SEI's technology strategy for R&D projects and external relationships by aligning the expertise of the SEI technical staff to identify and respond to the needs of government sponsors, and partners and help the SEI shape future innovations in complex software-reliant systems.
4. **1/1/10 – 12/31/13: Member of the Air Force Scientific Advisory Board.** Worked on several studies related to Cyber-Situational Awareness and Sustaining Aging Aircraft.
5. **9/10 – 12/11: Deputy Director of Research and Chief Technology Officer at the Software Engineering Institute (SEI).** Lead the formulation of the SEI's technology strategy for R&D projects and external relationships by aligning the expertise of the SEI technical staff to identify and respond to the needs of sponsors, customers, and partners and help the SEI shape future innovations in complex software-reliant systems.
6. **07/05 – 8/10: Visiting Scientist at Carnegie Mellon University's Software Engineering Institute**. Assisted Linda Northrop and the Ultra-Large-Scale (ULS) Systems team to define the challenge problems, promising technology areas, and research roadmaps for the national R&D effort on building the software-reliant systems of the future that are likely to have billions of lines of code. This activity is defining a broad, multi-disciplinary research agenda for developing ULS systems of the future.
7. **3/03 – 5/07: Schafer Government Solutions.** Worked as a Scientific, Engineering, and Technical Assistance (SETA) contractor for Dr. Joseph Cross on the DARPA Adaptive and Reflective Middleware Systems (ARMS) program.
8. **3/02 – 12/02: Program Manager at DARPA.** Led the National effort on middleware as a Program Manager for over $60 million dollars of funding at the DARPA Information Exploitation Office (IXO). Programs include Program Composition for Embedded Systems (PCES) and National Experimentation Platform for Hybrid and Embedded Systems (NEPHEST).
9. **3/02 – 12/02: Program Manager at DARPA.** Led the National effort on middleware as a Program Manager for over $60 million dollars of funding at the DARPA Information Exploitation Office (IXO). Programs include Program Composition for Embedded Systems (PCES) and National Experimentation Platform for Hybrid and Embedded Systems (NEPHEST).
10. **9/01 – 3/02: Deputy Office Director at DARPA.** Served as the Deputy Director for the DARPA Information Technology Office (ITO), helping set and guide the National IT research and development agenda and manage programs on autonomous systems, network-centric command and control systems, combat systems, real-time avionics systems, distributed real-time and embedded systems, and augmented cognition for the U.S. Department of Defense.
11. **6/00 – 3/02: Program Manager at DARPA.** Led the National effort on middleware as a Program Manager for over $60 million dollars of funding at the DARPA Information Technology Office (ITO). Programs included the Program Composition for Embedded Systems (PCES).
12. **6/01 – 6/02: Co-chair for the Software Design and Productivity (SDP) Coordinating Group.** The SDP Coordinating Group formulates the multi-agency research agenda in fundamental soft- ware design for the Federal government's Networking and Information Technology Research and Development (NITR&D) Program, which is the collaborative IT research effort of the major Federal science and technology agencies.

- **Industry Positions**

1. **4/13 – 2/18: Member of the Board of Directors at Real-Time Innovations (RTI).** Work with the CEO and other members of the Board of Directors of RTI to help assess company technical and business strategy.
2. **06/09 – 8/10: Chief Technology Officer for Zircon Computing.** Assisted in the strategic direction of Zircon Computing technology development in the areas of adaptive distributed computing middleware for high-performance and real-time applications. Help to formulate the technology strategy for open-source middleware platforms, R&D partnerships, and external relationships.
3. **10/06 – 5/09: Chief Technology Officer for PrismTechnologies.** Assisted in the strategic direction of PrismTechnologies technology development in the areas of open-source middleware platforms and model-driven tools. Help to formulate the technology strategy for open-source middleware platforms and model-driven tools, R&D partnerships, and external relationships.
4. **6/90 – 11/90: Member of the Technical Staff at Independent Technologies.** Worked as a software engineer for Independence Technologies, which was one of the largest sup- pliers of enterprise-level TUXEDO systems, providers of professional services, and developers of management and connectivity software to support OLTP environments.
5. **Summer of 87: Technical Intern.** Worked with Dr. Peter G. W. Keen at the International Center for Information Technology, Washington D.C. on various projects, including software productivity, videotex, and smartcards.
6. **Summer of 86: Statistical Programmer.** Programmed SPSS and SAS applications for the "Justice Delayed" project under the direction of Dr. Gene Flango at the National Center for State Courts, Williamsburg, Virginia.

Publications

In Print

- **Refereed Journal Publications**

J144 Douglas C. Schmidt and Dan Runfola, "The Democratization of Computational Thinking: Education, Practice, and Our AI-Augmented Future, Journal of Software, Volume 5, Number 2, June, 2026.

J143 Ashraf Elnashar, Douglas C. Schmidt, and Jules White, "Preference-Driven Prompt Refinement for Software Development: A Cross-Model Analysis of GPT-5, Journal of System Architecture, April, 2026.

J142 Ashraf Elnashar, Douglas C. Schmidt, and Jules White, "Preference-Driven Refinement of Prompts: A Systematic Prompt Engineering Method for Helping to Automate Software Engineering," Journal of Software, Volume 21, Number 1, 2026.

J141 Douglas C. Schmidt, "The Coming Commoditization of Computational Thinking," Communications of the ACM, Volume 69, Number 4, April, 2026.

J140 Douglas C. Schmidt, "From Code to Intent: Re-Architecting Internet Computing for the AI Era," *IEEE Internet Computing*, Volume 29, Number 6, Nov-Dec, 2025.

J139 Ashraf Elnashar, Douglas C. Schmidt, and Jules White, "Prompt Engineering for Structured Data: A Comparative Evaluation of Styles and LLM Performance," Journal of Artificial Intelligence and Autonomous Systems, ELSP, volume 2, number 2, November 2025.

J138 Douglas C. Schmidt, "Software Testing in the Generative Artificial Intelligence Era: A Practitioner's Playbook," *IEEE Computer*, Volume 58, number 7, July 2025, pp. 147–152.

J137 Ashraf Elnashar, Jules White, and Douglas C. Schmidt, "Enhancing Structured Data Generation with GPT-4o Evaluating Prompt Efficiency Across Prompt Styles," *Frontiers in Artificial Intelligence*, Volume 8, March 25th, 2025, pp. 1–13.

J136 John E. Robert, James Ivers, Douglas C. Schmidt, Ipek Ozkaya, Shen Zhang, "The Future of Software Engineering and Acquisition with Generative AI," STSC *CrossTalk, The Journal of Defense Software Engineering*, Volume 37, Number 2, May 2024.

J135 Anita Carleton, Douglas C. Schmidt, Forrest Shull, John Robert, and Ipek Ozkaya, "Five Critical Challenges for Software and AI Engineering," STSC *CrossTalk, The Journal of Defense Software Engineering*, Volume 37, Number 1, pp. 32–43, February 2024.

J134 Douglas C. Schmidt, Jesse Spencer-Smith, Quchen Fu, and Jules White, "Towards a Catalog of Prompt Patterns to Enhance the Discipline of Prompt Engineering," *Ada User Journal (AUJ)*, Volume 44, Number 2, pp. 220–227, September 2023.

J133 Yu Yao, Maria Powell, Jules White, Jian Feng, Quchen Fu, Peng Zhang, and Douglas C. Schmidt, "A Multi-stage Diagnosis Strategy based on Transfer Learning for a Class of Rare Laryngeal Movement Disorders," the Elsevier *Computers in Biology and Medicine* journal, 166, pp. 1–12, 2023.

J132 Peng Zhang, Adair Kelly, Douglas C Schmidt, and Jules White, "Design Pattern Recommen-dations for Building Decentralized Healthcare Applications," *Frontiers in Blockchain*, Volume 6, pp 1–18, 2023.

J131 Quchen Fu, Ramesh Chukka, Keith Achorn, Thomas Atta-fosu, Deepak R. Canchi, Zhongwei Teng, Jules White, and Douglas C. Schmidt. "Deep Learning Models on CPUs: A Methodology for Efficient Training," *Journal of Machine Learning Theory, Applications and Practice*, Vol. 1, pp 45–82, 2023.

J130 Quchen Fu, Zhongwei Teng, Marco Georgaklis, Jules White, and Douglas C. Schmidt, "NL2CMD:

An Updated Workflow for Natural Language to Bash Commands Translation," The *Journal of Machine Learning Theory, Applications and Practice*, Vol. 1, pp 1–38., 2022.

J129 Peng Zhang, Christopher Fonnesbeck, Douglas C. Schmidt, Jules White, Samantha Kleinberg, Shelagh A. Mulvaney, "Understanding Barriers to Self-Management in Type 1 Diabetes Using Machine Learning and Momentary Assessment," the JMIR *Journal of mHealth and uHealth*, Vol 10., No 5., March 2022.

J128 Summer Weber, Elyse Shearer, Shelagh Mulvaney, Douglas C. Schmidt, Chris Thompson, Jes- sica Jones, Haseeb Ahmad, Martina Coe, and Pam Hull, "Prioritization of Features for Mobile Phone Applications for Families in a Federal Nutrition Program for Low-income Women, In- fants, and Children: User-Centered Design Approach," *JMIR Formative Research*, Vol 5., No 7., July 2021.

J127 Alex Roehrs, Cristiano A. da Costa, Rodrigo R. Righi, Andre H. Mayer, Valter F. da Silva, Jose R. Goldim, and Douglas C. Schmidt, "Integrating Multiple Blockchains to Support Distributed Personal Health Records," the SAGE *Health Informatics Journal*, April, 2021.

J126 Zhongwei Teng, Peng Zhang, Xiao Li, William Nock, Denis Gilmore, Marcelino Rodriguez- Cancio, Jules White, Jonathan C. Nesbitt, Douglas C. Schmidt, "Authentication and Integra- tion Approaches for mHealth Apps from a Usability View," the journal *Advances in Electrical and Electronic Engineering*, North America, 19, March, 2021.

J125 Scott Eisele, Aron Laszka, Douglas C. Schmidt, and Abhishek Dubey, "The Role of Blockchains in Multi-Stakeholder Transactive Energy Systems," the journal *Frontiers in Blockchain: Emerging Technologies and Blockchain in Action: Applications in Supply Chain Management and Energy*, volume 3, December, 2020, pps. 1-55.

J124 Peng Zhang, Chris Downs, Nguyen Thanh Uyen Le, Cory Martin, Paul Shoemaker, Clay Wittwer, Luke Mills, Liam Kelly, Stuart Lackey, Douglas C. Schmidt, Jules White, "Towards Patient-centered Stewardship of Research Data and Research Participant Recruitment with Blockchain Technology," the *Frontiers in Blockchain special selection on Non-Financial Blockchain*, 2020, volume 3, pps. 1-32.

J123 Yao Pan, Fangzhou Sun, Jules White, Douglas C. Schmidt, Jacob Staples, Lee Krause, and Zhongwei Teng, "Detecting Web Attacks with End-to-End Deep Learning," the Springer *Jour- nal of Internet Services and Applications*, 2019, volume 10, number 16, pps. 1-22.

J122 Shelagh Mulvaney, Lori Laffel, Korey Hood, Cindy Lybarger, Sarah Vaala, and Douglas C. Schmidt, "A Mobile App Identifies Momentary Psychosocial and Contextual Factors Related to Mealtime Self-Management in Adolescents with Type 1 Diabetes," Journal of the American Medical Informatics Association, Oxford University Press, 2019, Volume 26, Number 12, pps. 1627-1631.

J121 Maria E. Powell, Marcelino Rodriguez Cancio, David Young, William Nock, Beshoy Abdelmessih, Amy Zeller, Irvin Perez Morales, Peng Zhang, C Gaelyn Garrett, Douglas Schmidt, Jules White, and Alexander Gelbard, "Decoding Phonation with Artificial Intelligence (DEP AI): Proof of

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c72 Richard Schantz and Douglas C. Schmidt, "Research Advances in Middleware for Distributed Systems: State of the Art," Computer Communications stream of the 17th IFIP World Com- puter Congress, Montreal, Canada, August 25-30, 2002.

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C69 David A. Karr, Craig Rodrigues, Yamuna Krishnamurthy, Irfan Pyarali, and Douglas C. Schmidt "Application of the QuO Quality-of-Service Framework to a Distributed Video Ap- plication," Proceedings of the 3rd International Symposium on Distributed Objects and Ap- plications, September 8-10, 2001, Rome, Italy.

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C67 Andy Gokhale, Bala Natarajan, Douglas C. Schmidt and Shalini Yajnik, "Applying Patterns to Improve the Performance of Fault-Tolerant CORBA," of the 7th International Conference on High Performance Computing (HiPC 2000), ACM/IEEE, Bangalore, India, December 2000.

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Schmidt, Panrit Tosukhowong, "MISE: The MediaSys Image Search Engine," 11th International Conference on Database and Expert Systems Applications (DEXA 2000), London, UK, September 2000.

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the 5th Pattern Languages of Programing Conference, Allerton Park, Illinois, USA, 15–18 August 1999.

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C47 Andy Gokhale and Douglas C. Schmidt, "Techniques for Optimizing CORBA Middleware for Distributed Embedded Systems" Proceedings of INFOCOM '99, March 21-25th, New York, New York.

C46 Sumedh Mungee, Nagarajan Surendran, and Douglas C. Schmidt, "The Design and Perfor- mance of a CORBA Audio/Video Streaming Service," Proceedings of the 31st Hawaii International Conference on System Systems (HICSS), Hawaii, January, 1999, minitrack on Multimedia DBMS and the WWW, Hawaii, January 1999.

C45 Chris D. Gill, David L. Levine, and Douglas C. Schmidt, "Dynamic Scheduling for Avionics Applications," Proceedings of the 17th IEEE/AIAA Digital Avionics System Conference, 31 October - 6 November 1998.

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C42 Prashant Jain, Seth Widoff, and Douglas C. Schmidt, "The Design and Performance of Med- Java, A Distributed Electronic Medical Imaging System Developed with Java Applets and Web Tools" Proceedings of the 4th USENIX Conference on Object-Oriented Technologies and Systems, Sante Fe, New Mexico, April 1998. This was selected as the best student paper in the conference.

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C40 Aniruddha Gokhale and Douglas C. Schmidt, "Optimizing the Performance of the CORBA Internet Inter-ORB Protocol Over ATM," Proceedings of the 31st Hawaii International Conference on System Systems (HICSS), Hawaii, January, 1998. This was selected as the best paper in the Software Technology Track (188 submitted, 77 accepted).

C39 Aniruddha Gokhale and Douglas C. Schmidt, "Evaluating the Performance of Demultiplexing Strategies for Real-time CORBA," Proceedings of GLOBECOM '97 conference, IEEE, Phoenix, AZ, November, 1997.

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C29 Aniruddha Gokhale and Douglas C. Schmidt, "Performance of the CORBA Dynamic Invocation Interface and Internet Inter-ORB Protocol over High-Speed ATM Networks," Proceedings of GLOBECOM '96, IEEE, London England, November, 1996.

C28 Aniruddha Gokhale and Douglas C. Schmidt, "Measuring the Performance of Communication Middleware on High-Speed Networks," Proceedings of SIGCOMM '96, ACM, San Francisco, August 28-30th, 1996.

C27 Irfan Pyarali, Tim Harrison, and Douglas. C. Schmidt, "Design and Performance of an Object-Oriented Framework for High-Speed Electronic Medical Imaging," Proceedings of the 2nd Conference on Object-Oriented Technologies and Systems (COOTS), USENIX, Toronto, June 18-22, 1996.

C26 Douglas C. Schmidt, "A Family of Design Patterns For Flexibly Configuring Network Services in Distributed Systems," Proceedings of the International Conference on Configurable Distributed Systems, IEEE, Annapolis, Maryland, May 6-8, 1996.

C25 Douglas C. Schmidt "Using Design Patterns to Develop High-Performance Object-Oriented Communication Software Frameworks," Proceedings of the 8th Annual Software Technology Conference, Salt Lake City, Utah, April 21-26, 1996.

C24 Douglas C. Schmidt, Timothy H. Harrison, and Irfan Pyarali, "An Object-Oriented Framework for High-Performance Electronic Medical Imaging," Proceedings of the *Very High Resolution and Quality Imaging* mini-conference at the Symposium on Electronic Imaging in the International Symposia Photonics West 1996, SPIE, San Jose, California USA, January 27 - February 2, 1996.

C23 Douglas C. Schmidt and Charles D. Cranor, "Half-Sync/Half-Async: A Pattern for Efficient and Well-structured Concurrent I/O," *The 2nd Pattern Languages of Programs Conference* Monticello, Illinois, September 6-8, 1995.

C22 R. Greg Lavender and Douglas C. Schmidt, "Active Object: An Object Behavioral Pattern for Concurrent Programming," *The 2nd Pattern Languages of Programs Conference*, Monticello, Illinois, September 6-8, 1995.

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C17 Douglas C. Schmidt and Tatsuya Suda, "Experiences with an Object-Oriented Architecture for Developing Dynamically Extensible Network Management Software," *Proceedings of the Globecom Conference*, IEEE, San Francisco, California, November, 1994, pp. 1-7.

C16 Douglas C. Schmidt and Paul Stephenson, "Achieving Reuse Through Design Patterns," *Pro- ceedings of the 3rd Annual C++ World Conference*, SIGS, Austin, Texas, November 14-18, 1994.

C15 Douglas C. Schmidt, "Developing Object-Oriented Frameworks to Dynamically Configure Concurrent, Multi-service Network Daemons," *Proceedings of the 3rd Annual C++ World Conference*, SIGS, Austin, Texas, November 14-18, 1994.

C14 Douglas C. Schmidt, "Reactor: An Object Behavioral Pattern for Concurrent Event Demulti- plexing and Dispatching," *The 1st Annual Conference on the Pattern Languages of Programs*, Monticello, Illinois, August, 1994, pp. 1-10.

C13 Douglas C. Schmidt, "The ADAPTIVE Communication Environment: An Object-Oriented Network Programming Toolkit for Developing Communication Software," *Proceedings of the 12th Annual Sun Users Group Conference*, SUG, San Francisco, June 16-17, 1994. This paper won the "best student paper" award at the conference.

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C11 Douglas C. Schmidt and Tatsuya Suda, "The ADAPTIVE Service Executive: An Object-Oriented Architecture for Configuring Concurrent Distributed Communication Systems," *Proceedings of the 8th International Working Conference on Upper Layer Protocols, Architectures, and Applications*, IFIP, Barcelona, Spain, June 1-3, 1994, pp. 163-178.

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C9 Douglas C. Schmidt, "The ADAPTIVE Communication Environment: Object-Oriented Network Programming Components for Developing Client/Server Applications," *Proceedings of the 11th Annual Sun Users Group Conference*, SUG, San Jose, December 7-9, 1993, pp. 214-225. This paper won the "best student paper" award at the conference.

C8 Douglas C. Schmidt and Paul Stephenson, "An Object-Oriented Framework for Developing Network Server Daemons," *Proceedings of the 2nd Annual C++ World Conference*, SIGS, Dallas, Texas, October 18-22, 1993, pp. 73-85.

C7 Douglas C. Schmidt, "Object-Oriented Techniques for Developing Extensible Network Servers," *Proceedings of the 2nd Annual C++ World Conference*, SIGS, Dallas, Texas, October 18-22, 1993.

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C5 Douglas C. Schmidt and Tatsuya Suda, "ADAPTIVE: a Framework for Experimenting with High-Performance Transport System Process Architectures," *Proceedings of the 2nd International Conference on Computer Communications and Networks*, ISCA, San Diego, California, June 28-30, 1993, pp. 1-8.

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C3 Douglas C. Schmidt, Donald F. Box, and Tatsuya Suda, "ADAPTIVE: A Flexible and Adaptive Transport System Architecture to Support Lightweight Protocols for Multimedia Applications on High-Speed Networks," *Proceedings of the 1st Symposium on High Performance Distributed Computing*, IEEE, Syracuse, New York, September 9-11, 1992, pp. 174-186.

C2 Richard W. Selby, Adam A. Porter, Douglas C. Schmidt, and James Berney, "Metric-Driven Analysis and Feedback Systems for Enabling Empirically Guided Software Development," *Proceedings of the 13th Annual International Conference on Software Engineering*, IEEE, Austin, Texas,

May, 1991, pp. 430-443.

C1 Douglas C. Schmidt "GPERF: A Perfect Hash Function Generator," *Proceedings of the 2nd C++ Conference*, USENIX, San Francisco, California, April 9-11, 1990, pp. 87-102.

- **Refereed Workshop Publications**

W76 William Schreiber, Douglas C. Schmidt, and Jules White, "Toward A Pattern Language for Agentic Retrieval Pipelines: From Intent to Adaptive Knowledge Acquisition," the MiniPlop on Patterns for Generative AI in Software Engineering Activities co-located with XP 2026, April, Wed 8th, 2026 São Paulo, Brazil.

W75 Sklyer Grandel, Douglas C. Schmidt, and Kevin Leach "Applying Large Language Models to Enhance the Assessment of Parallel Functional Programming Assignments," Proceedings of the 2024 International Workshop on Large Language Models for Code, Lisbon, Portugal, 20 April 2024.

W74 Nick Guertin, Douglas C. Schmidt, and Harry Levinson, "Business and Organizational Impacts for Modular Flexible Ships," Proceedings of the 2018 Design Sciences Series Workshop on Modular Adaptable Ships, Washington DC, November 14-15, 2018.

W73 Michael Walker, Abhishek Dubey, Aron Laszka, and Douglas C. Schmidt, "PlaTIBART: a Platform for Transactive IoT Blockchain Applications with Repeatable Testing," Proceedings of the ACM/IFIP/USENIX 4th Workshop on Middleware and Applications for the Internet of Things, December 2017, Las Vegas, USA.

W72 Abhishek Dubey, Subhav Pradhan, Douglas C. Schmidt, Sebnem Rusitschka, and Monika Sturm, "The Role of Context and Resilient Middleware in Next Generation Smart Grids," Proceedings of the 3rd Middleware for Context-Aware Applications in the IoT (M4IOT 2016) Workshop at the ACM/IFIP/USENIX Middleware 2016 Conference, Dec 12 - 16, 2016, Trento, Italy.

W71 Violetta Vylegzhanina, Douglas C. Schmidt, and Jules White, "Gaps and Future Directions in Mobile Security Research," Proceedings of the Third International Workshop on Mobile Development Lifecycle, Pittsburgh, PA, October 26th, 2015.

W70 Violetta Vylegzhanina, Douglas C. Schmidt, Pamela Hull, Janice S. Emerson, Meghan E. Quirk, and Shelagh Mulvaney, "Helping Children Eat Well Via Mobile Software Technologies," Proceedings of the Second International Workshop on Mobile Development Lifecycle, October 21st, 2015, Portland, OR.

W69 Jules White and Douglas C. Schmidt, "R&D Challenges and Emerging Solutions for Multicore Deployment/Configuration Optimization," proceedings of the ACM Workshop on Future of Software Engineering Research (FoSER 2010), Santa Fe, NM, November 7-11, 2010.

W68 Will Otte, Douglas C. Schmidt, and Aniruddha Gokhale, "Towards an Adaptive Deployment and Configuration Framework for Component-based Distributed Systems," Proceedings of the 9th Workshop on Adaptive and Reflective Middleware (ARM 2010) November 27, 2010, Bangalore India, collocated with Middleware 2010.

W67 Jaiganesh Balasubramanian, Alexander Mintz, Andrew Kaplan, Grigory Vilkov, Artem Gleyzer, Antony Kaplan, Ron Guida, Pooja Varshneya and Douglas Schmidt, "Adaptive Parallel Computing for Large-scale Distributed and Parallel Applications," Proceedings of the Workshop on Data Dissemination for Large-scale Complex Critical Infrastructures (DD4LCCI), 27 April 2010, in conjunction with EDCC 2010, Valencia - Spain, April 28-30, 2010.

W66 Joe Hoffert, Douglas Schmidt, and Aniruddha Gokhale, "Adapting and Evaluating Distributed Real-time and Embedded Systems in Dynamic Environments," Proceedings of the Workshop on Data Dissemination for Large-scale Complex Critical Infrastructures (DD4LCCI), 27 April 2010, in conjunction with EDCC 2010, Valencia - Spain, April 28-30, 2010.

W65 Joe Hoffert, Dan Mack, and Douglas C. Schmidt, "Using Machine Learning to Maintain Pub/Sub System QoS in Dynamic Environments, Proceedings of the 8th Workshop on Adaptive and Reflective Middleware (ARM'09) December 1st 2009, Urbana Champaign, Illinois, USA collocated with Middleware 2009.

W64 Chris Thompson, Jules White, Brian Dougherty, and Douglas C. Schmidt, "Optimizing Mo- bile Application Performance with Model-Driven Engineering," Proceedings of the 7th IFIP Workshop on Software Technologies for Future Embedded and Ubiquitous Systems (SEUS 2009),

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4. "Addressing the Challenges of Tactical Information Management in Net-Centric Systems with the OMG Data Distribution Service (DDS)," the 16th International ACM Workshop on Parallel and Distributed Real-Time Systems (WPDRTS '08), Miami, Florida, April 14, 2008.
5. "The Design and Performance of Configurable Component Middleware for End-to-End Adaptation of Distributed Real-time Embedded Systems," proceedings of the 10th IEEE International Sym- posium on Object/Component/Service-oriented Real-time Distributed Computing (ISORC), May 7-9, 2007, Santorini Island, Greece.
6. "A Decision-Theoretic Planner for DRE Systems," 7th OMG Real-time/Embedded CORBA workshop, Arlington, VA, July 10–13, 2006.
7. "Model-driven QoS Provisioning for Real-time CORBA and CCM DRE Systems," 6th OMG Real-time/Embedded CORBA workshop, Arlington, VA, July 11–14, 2005.
8. "Research Advances in Middleware for Distributed Systems: State of the Art," Computer Com-munications stream of the 17th IFIP World Computer Congress, Montreal, Canada, August 25-30, 2002.
9. "Towards Highly Configurable Real-time Object Request Brokers," the IEEE International Sym-posium on Object-Oriented Real-time Distributed Computing (ISORC), Washington DC, April 29 – May 1, 2002.
10. "Operating System Performance in Support of Real-time Middleware," Proceedings of the 7th IEEE Workshop on Object-oriented Real-time Dependable Systems, San Diego, CA, January, 2002.
11. "Designing an Efficient and Scalable Server-side Asynchrony Model for CORBA," Proceedings of the ACM SIGPLAN Workshop on Optimization of Middleware and Distributed Systems (OM 2001), Snowbird, Utah, June 18, 2001.
12. "DOORS: Towards High-performance Fault-Tolerant CORBA," Proceedings of the 2nd International Symposium on Distributed Objects and Applications (DOA '00), OMG, Antwerp, Belgium, September 2000.
13. "The Design and Performance of a CORBA Audio/Video Streaming Service," Proceedings of the 31st Hawaii International Conference on System Systems (HICSS), Hawaii, January, 1999, mini- track on Multimedia DBMS and the WWW, Hawaii, January 1999.
14. "Alleviating Priority Inversion and Non-determinism in Real-time CORBA ORB Core Architectures," Proceedings of the Fourth IEEE Real-Time Technology and Applications Symposium (RTAS), Denver, Colorado, June 3-5, 1998
15. "Optimizing the Performance of the CORBA Internet Inter-ORB Protocol Over ATM," Proceedings of the 31st Hawaii International Conference on System Systems (HICSS), Hawaii, January, 1998. This was selected as the best paper in the Software Technology Track (188 submitted, 77 accepted).
16. "The Double-Checked Locking Pattern," *Proceedings of the 3rd annual Pattern Languages of Programming conference* in Allerton Park, Illinois, September 4-6, 1996.
17. "Acceptor and Connector: Design Patterns for Initializing Network Services," Proceedings of the EuroPLoP '96 conference, Kloster Irsee, Germany, July 10-14, 1996.
18. "Measuring the Performance of Communication Middleware on High-Speed Networks," Proceedings of SIGCOMM '96, ACM, San Francisco, August 28-30th, 1996.
19. "Design and Performance of an Object-Oriented Framework for High-Speed Electronic Medi- cal

Imaging," Proceedings of the 2nd Conference on Object-Oriented Technologies and Systems (COOTS), USENIX, Toronto, June 18-22, 1996.

20. "A Family of Design Patterns For Flexibly Configuring Network Services in Distributed Systems," Proceedings of the International Conference on Configurable Distributed Systems, IEEE, Annapolis, Maryland, May 6-8, 1996.
21. "Using Design Patterns to Develop High-Performance Object-Oriented Communication Software Frameworks," Proceedings of the 8th Annual Software Technology Conference, Salt Lake City, Utah, April 21-26, 1996.
22. "An Object-Oriented Framework for High-Performance Electronic Medical Imaging," Proceedings of the *Very High Resolution and Quality Imaging* mini-conference at the Symposium on Electronic Imaging in the International Symposia Photonics West 1996, SPIE, San Jose, California USA, January 27 - February 2, 1996.
23. "Half-Sync/Half-Async: A Pattern for Efficient and Well-structured Concurrent I/O," *Proceedings of the 2nd Pattern Languages of Programs Conference* Monticello, Illinois, September 6-8, 1995.
24. "Acceptor and Connector: Design Patterns for Actively and Passively Initializing Network Services." Workshop on Pattern Languages of Object-Oriented Programs at ECOOP '95, August 7 – 1, 1995, Aarhus, Denmark.
25. "Object-Oriented Components for High-speed Network Programming," *Proceedings of the Conference on Object-Oriented Technologies (COOTS)*, USENIX, June 26-29, 1995 Monterey, California, USA, pp. 21–38.
26. "Experience Using Design Patterns to Evolve Communication Software Across Diverse OS Plat- forms," *Proceedings of the 9th European Conference on Object-Oriented Programming (ECOOP)*, ACM, Aarhus, Denmark, August, 1995.
27. "Measuring the Performance of Parallel Message-based Process Architectures," *Proceedings of the INFOCOM Conference on Computer Communications*, IEEE, Boston, MA, April, 1995, pp. 624– 633.
28. "High-Performance Event Filtering for Dynamic Multi-point Applications," Proceedings of the 1st Workshop on High Performance Protocol Architectures (HIPPARCH), INRIA, Sophia Antipolis, France, December, 1994, p 1–8.
29. "Flexible Configuration of High-Performance Object-Oriented Distributed Communication Sys- tems," 9th *OOPSLA Conference, invited paper to the Workshop on Flexibility in Systems Software*, ACM, Portland, Oregon, October, 1994, pp. 1–4.
30. "Performance Experiments on Alternative Methods for Structuring Active Objects in High-Performance Parallel Communication Systems," 9th *OOPSLA Conference, poster session*, ACM, Portland, Oregon, October, 1994, pp. 1–12.
31. "Measuring the Impact of Alternative Parallel Process Architectures on Communication Subsystem Performance," *Proceedings of the Proceedings of the 4th International Workshop on Protocols for High-Speed Networks*, IFIP, Vancouver, British Columbia, August, 1994, pp. 103–118.
32. "Reactor: An Object Behavioral Pattern for Concurrent Event Demultiplexing and Dispatching," *Proceedings of the 1st Annual Conference on the Pattern Languages of Programs*, Monticello, Illinois, August, 1994, pp. 1–10.
33. "Experiences with an Object-Oriented Architecture for Developing Dynamically Extensible Network Management Software," *Proceedings of the Globecom Conference*, IEEE, San Francisco, California, November, 1994, pp. 1–7.
34. "Configuring Function-based Communication Protocols for Distributed Applications," *Proceedings of the 8th International Working Conference on Upper Layer Protocols, Architectures, and Applications*, IFIP, Barcelona, Spain, June 1-3, 1994, pp. 361–376.
35. "The ADAPTIVE Service Executive: An Object-Oriented Architecture for Configuring Concurrent Distributed Communication Systems," *Proceedings of the 8th International Working Conference on Upper Layer Protocols, Architectures, and Applications*, IFIP, Barcelona, Spain, June 1-3, 1994, pp. 163–178.
36. "ASX: An Object-Oriented Framework for Developing Distributed Applications," *Proceedings of the 6th C++ Conference*, USENIX, Cambridge, Massachusetts, April, 1994, pp. 200–220.

37. "The Service Configurator Framework: An Extensible Architecture for Dynamically Configuring Concurrent, Multi-service Network Daemons," *Proceedings of the* 2nd *International Workshop on Configurable Distributed Systems*, IEEE, Pittsburgh, PA, March 21-23, 1994, pp. 190–201.
38. "Tools for Generating Application-Tailored Multimedia Protocols on Heterogeneous Multi-Processor Platforms," *Proceedings of the* 2nd *Workshop on High-Performance Communications Subsystems*, IEEE, Williamsburg, Virginia, September 1-3, 1993, pp. 1–7.
39. "A Framework for Developing and Experimenting with Parallel Process Architectures to Support High-Performance Transport Systems," *Proceedings of the* 2nd *Workshop on High-Performance Communications Subsystems*, IEEE, Williamsburg, Virginia, September 1-3, 1993, pp. 1–8.
40. "ADAPTIVE: a Framework for Experimenting with High-Performance Transport System Process Architectures," *Proceedings of the* 2nd *International Conference on Computer Communications and Networks*, ISCA, San Diego, California, June 28-30, 1993, pp. 1–8.
41. "ADAPTIVE: A Flexible and Adaptive Transport System Architecture to Support Lightweight Protocols for Multimedia Applications on High-Speed Networks," *Proceedings of the* 1st *Symposium on High Performance Distributed Computing*, IEEE, Syracuse, New York, September 9-11, 1992, pp. 174–186.
42. "GPERF: A Perfect Hash Function Generator," *Proceedings of the* 2nd *C++ Conference*, USENIX, San Francisco, California, April 9-11, 1990, pp. 87–102.

Congressional Testimony

1. Testified before the United States House Armed Services Committee on DOT&E oversight of Tactical Air and Land Combat Systems, April 16th, 2024.
2. Testified before the United States Senate Armed Services Committee at my confirmation hearing for the position of Director of Operational Test and Evaluation, January 23rd, 2024.

Invited Talks

1. Invited panelist for the SRAI Webinar ``Co-Authorship in Context: Distinguishing Collaboration from Research Security Risk,'' October 29th, 2026.
2. ``Navigating Our AI Augmented Future in High-Stakes Domains,'' invited talk for the Business-Government Relations Council, Williamsburg, VA, October 14th, 2026.
3. ``Trusted AI for High-Consequence Work in High-Stakes Domains,'' invited talk for the Index AR Solutions Accelerating Workforce conference, Williamsburg, VA, October 27th, 2026.
4. Invited panelist for the "ACM SPLASH/OOPSLA 40th Anniversary panel," SPLASH conference, Oakland, CA, October 5th, 2026.
5. "The Democratization of Computational Thinking: Education, Practice, & Our AI-Augmented Future," Invited speaker for the 13th International Conference on Artificial Intelligence (ICOAI 2026), Paris, France September 26th, 2026.
6. Invited panelist for the "Are there "Future-Proofed" Majors as Artificial Intelligence Takes Off?" at the Virtual Pioneer Co-Curricular Summit, September 19th, 2026.
7. "Viking at 50: The People & Technology That Took Us to Mars, " opening remarks at the symposium on the Exploration of Mars & the Search for Life: Viking to Humans, William & Mary, September 18th, 2026.
8. "Governing ESSL at the Speed of Software-Defined, " invited panelist at the Former DOT&E Directors Panel, Institute for Defense Analysis, Arlington, VA, September 14th, 2026.
9. "The Democratization of Computational Thinking: A Case Study of AI-Augmented Problem Solving," invited keynote for the Virginia Special Interest Group Meeting for the Society of Research Administrators International, William & Mary, July 17, 2026.
10. "The Pentagon's Revolution in Software-Defined Warfare & Its T&E Dilemma," invited talk for the AI for Defense Software Engineering workshop at the National Academy of Sciences, Engineering, and Medicine, Washington, DC, June 30th, 2026.
11. "The Democratization of Computational Thinking: Education, Practice, and Our AI-Augmented Future," presentation for Keystone, New York, NY, June 15th, 2026.

12. "Consumer Data Protection in Virginia and Beyond," moderated a panel at the 2026 Technology Policy Symposium organized by the Joint Commission on Technology and Science (JCOTS), Williamsburg, VA, June 3rd, 2026.
13. "Navigating Our AI-Augmented Future in High-Stakes Domains," Air Combat Command, Langley, Virginia, June 3rd, 2026.
14. "Navigating Our AI-Augmented Future in High-Stakes Domains," HCA Healthcare Sarah Cannon Cancer Network, Nashville, TN, May 21st, 2026.
15. ``Navigating Our AI-Augmented Future in High-Stakes Domains,'' Tidewater Integrated Combat Symposium (TWICS), Hampton, Virginia, May 5th, 2026.
16. ``Unbinding Prometheus: How Generative AI is Liberating Computational Thinking from Coding,'' invited talk at the Third International Conference on Artificial Intelligence and Machine Learning (AIM-2026) April 28th, 2026, San Francisco, CA.
17. "Unbinding Prometheus: How Generative AI is Liberating Computational Thinking from Coding," invited speaker at the DATAWorks 2026 conference, Alexandria, VA, April 21st, 2026.
18. ``Cyber-Security and You: Practicing Safe Surfing on the Internet,'' invited talk at Williamsburg Landing, Williamsburg, VA 23185, April 13th, 2026.
19. ``Navigating Our AI-Augmented Future,'' invited talk at the Day For Admitted Students, Williamsburg, VA 23185, April 12th, 2026.
20. Invited panelist for the "Tri-Service Panel: Establishing a Unified Joint MOSA Strategy" at the MOSA for Defense and Warfare Summit, National Harbor, MD, April 9th, 2026.
21. "The Importance of Prompt Patterns of Computational Thinking," invited talk for the Generative AI in Software Engineering Activities workshop at XP 2026, April 8th, 2026, San Paulo, Brazil.
22. ``Education for Tomorrow: How AI Will Support Student Learning,'' Family Engagement Webinar Series, William & Mary, March 26th, 2026.
23. Invited panelist for the "Escaped from the Lab: ACM's SPLASH Influences on the Future of Software?" panel at SPLASH 2026, October 5th, 2026, Oakland, CA.
24. "Navigating Our AI-Augmented Future in High-Stakes Domains," keynote speaker at the 26th ACM/IFIP International Middleware Conference, Nashville, TN, December 18th, 2025.
25. "Overview of Generative AI and Computational Thinking," invited speaker at the Georgia Cyber Center, Augusta, Georgia, December 2nd, 2025.
26. Invited panelist for the "Connecting Data: Digital Infrastructure Here and Beyond" panel at the Convergence 2025 conference, Williamsburg, VA, November 18th, 2025.
27. "The Coming Commoditization of Computational Thinking," keynote speaker at the COVA Commonwealth Cyber Initiative Research Meeting, Old Dominion University, Virginia Beach, VA, November 7th, 2025.
28. "Preparing for the Brave New World of AI," keynote speaker at the Kiwanis Club meeting, Williamsburg, VA, October 29th, 2025.
29. "Preparing (for) the AI-powered Workforce," keynote speaker at the State of Greater Williamsburg meeting, Williamsburg, VA, October 15th, 2025.
30. "Unbinding Prometheus: How Generative AI is Liberating Computational Thinking from Coding," invited speaker at University of Chicago, Illinois, CS Colloquia, October 2nd, 2025.
31. Invited panelist in the Virginia Academic of Science, Engineering, and Medicine (VASAM) at Virginia Tech's campus in Alexandria, Virginia, September 30th, 2025.
32. Invited panelist in the AI Governance Symposium at Virginia Tech's campus in Alexandria, Virginia, September 3rd, 2025.
33. "Navigating Our AI-Enabled Future in High-Stakes Domains," invited talk at the Medtronic Cardiac Rhythm Management AI Summit, Minneapolis, Minnesota, August 19th, 2025.
34. "Navigating Our AI-Augmented Future in Software Engineering," keynote talk at the International Workshop on Envisioning the AI-augmented Software Development Life Cycle collocated with the ACM Foundations of Software Engineering (FSE) conference, June 26th, 2025, Trondheim, Norway.

35. "LLMs in Software Engineering & Software Assurance," invited panelist at the HCI International Conference, Gothenburg, Sweden, June 25th, 2025.
36. "Navigating Our AI-Enabled Future in High-Stakes Domains," keynote speaker at the 26th IEEE International Conference on Mobile Data Management, Irvine, CA, June 3rd, 2025.
37. "Unbinding Prometheus: How Generative AI is Liberating Computational Thinking from Coding," keynote speaker at the Medtronic Cardiac Rhythm Management AI Summit, Minneapolis, Minnesota, May 22nd, 2025.
38. "Navigating Our AI-Enabled Future in Defense & Other High-Stakes Domains," keynote speaker at the AFOTEC Data & Analyst Community Summit, Albuquerque, New Mexico, May 5th, 2025.
39. ``Surfing the AI Wave: A Human-Centered Approach to Innovation and Ethics,'' invited speaker for the Tack Lecture, William & Mary, Williamsburg, VA, April 9th, 2025.
40. "Generative Artificial Intelligence in the DoD Acquisition Lifecycle," invited panelist for an AIRC webinar, January 6th, 2025.
41. "Test & Evaluation for Emerging Technologies," keynote talk for the DoD PSA 101 lecture series, Pentagon, November 22nd, 2024.
42. "Test & Evaluation for Emerging Technologies," keynote talk at the Sixth Annual Recent Advances in Artificial Intelligence for National Security (RAAINS) workshop, MIT Lincoln Labs, November 18-21, 2024.
43. "Test & Evaluation for Emerging Technologies," keynote talk at the 16th Annual Research Review of the Systems Engineering Research Center (SERC), Washington, DC, November 12th, 2024.
44. "Test & Evaluation for Emerging Technologies," keynote talk at the National Reconnaissance Office, Chantilly, VA, November 7th, 2024.
45. "Test & Evaluation for Emerging Technologies," invited panelist at the ITEA Annual International Test & Evaluation Symposium, Huntsville, AL, November 5th 2024.
46. "Operational Test & Evaluation Considerations for Emerging Technologies," keynote talk for the 27th Annual NDIA Systems and Mission Engineering Conference, Norfolk, VA, October 29th, 2024.
47. "Counter Unmanned Systems (C-UXS): Emerging Technologies, Testing, & Evaluation," keynote talk for the 3rd Annual Unmanned Systems West conference, San Diego, CA, September 26th, 2024.
48. "Emerging Cyber & AI Technologies and Test & Evaluation Considerations," keynote talk for the International Test & Evaluation Association (ITEA) Cybersecurity Workshop, Orlando, FL, September 19th 2024.
49. "DO&E Unmanned Air Systems Critical Examination of CUAS Technology and Strategy," invited keynote talk at the IDGA Counter-USA Summit, Crystal City, VA, August 28th, 2024.
50. "Strategies and Tactics for Operational and Life Fire Test and Evaluation," keynote talk for the ASsurance Evidence for continuously Evolving Real-Time Systems (ASERT) workshop, Arlington, VA, July 30th, 2024.
51. "Strategies and Tactics for Operational and Life Fire Test and Evaluation," keynote talk for the Defense Science Study Group (DSSG) meeting at the Institute for Defense Analysis (IDA), July 16th, 2024.
52. "Generative AI and Software Engineering Education," invited panelist for an SEI webinar, June 27th, 2024.
53. "The MOSA Relationship with Operational and Life Fire Testing," invited keynote talk at MOSA Industry and Government Summit, National Harbor, MD, June 18th, 2024.
54. "Testing for Assured Space Resilience," invited keynote talk at Summit 2024: Spectrum Control for Resilient Space Operations, Bedford, MA, June 11th, 2024.
55. "Assessing the Adequacy of Current GPS Equipment for Future Operational Effectiveness," invited keynote talk at the Assured PNT Summit, Washington, DC, May 30th, 2024.
56. "Counter UAS (C-UAS): Emerging Technologies, Testing, & Evaluation," invited keynote talk at the 3rd Annual National Congress on Counter UAS Technology, Washington DC, May 23rd, 2024.
57. "View from the Bridge of DoD on Operational & Live Fire Test & Evaluation," invited keynote talk

at the NI Connect conference, Austin, Texas, May 20th, 2024.

58. "Test & Evaluation for the New Operational Environment," invited keynote talk at the Air Dominance Summit, Tuesday, May 14th, 2024, Las Vegas.
59. "Software Construction Through Compositional Correctness," keynote panel at the 27th Ibero- American Conference on Software Engineering (CIbSE 2024), May 8th, 2024, Curitiba, Brazil.
60. "The Role of MOSA in DoD System Acquisition and Assessment," keynote talk at the MOSA Defense Summit, National Harbor, MD, April 18th, 2024.
61. "DOT&E Background and Future Plans," keynote talk at the DATAWorks conference, Arlington, VA, April 17th, 2024.
62. "Navigating Our AI Enabled Future in Defense and Other High Stakes Domains," keynote talk at the AFCEA New Horizons Conference, Boston, MA, March 11th, 2024.
63. "Navigating Our AI-Augmented Future," invited talk for the 101st Air Assault Division Artillery (DIVARTY), Vanderbilt University, March 7th, 2024.
64. Invited panelist for the Vanderbilt webinar on "Navigating Our AI-Augmented Future in National Security and Other High-Stakes Domains," March 4th, 2024.
65. "ChatGPT is Just the Beginning: Generative AI will Transform Computing," invited talk for the University School of Nashville, Nashville, TN, February 26th, 2024.
66. Invited speaker for the keynote panel on "Accelerating Leadership and Strategic Advantage in Software Engineering" at the NASA JPL Software Symposium on February 15, 2024, Pasadena, CA.
67. Ask Us Anything: The Future of Software Engineering and Acquisition with Generative AI, invited panelist for an SEI webinar on generative AI for software, January 24th, 2024.
68. Testified before the United States Senate Armed Services Committee at my confirmation hearing for the position of Director of Operational Test and Evaluation, January 23rd, 2024.
69. "Navigating Our AI-Augmented Future," invited talk for the Oak Ridge National Labs, December 8th, 2023.
70. "Assuring the Future of Software Engineering & AI Engineering," invited talk at the AFSEC Independence Verification Summit, December 6th, 2023.
71. "Navigating Our AI-Augmented Future," invited talk for the AI & Local Business Leaders Event, Vanderbilt University, November 7th, 2023.
72. "Assuring the Future of Software Engineering & AI Engineering," invited talk for the Huntsville Chapter of the IEEE AESS Society, November 2nd, 2023.
73. "Navigating the Future of AI-Augmented Research & Education", invited talk for the 30th Pattern Languages of Programming conference, Allerton Park, IL, October 23rd, 2023.
74. "Navigating the Future of AI-Augmented Research & Education," invited talk for the Computer Science department at William & Mary, October 20th, 2023.
75. "Ask Us Anything: Generative AI Edition," invited panelist for an SEI webinar on generative AI, September 26th, 2023.
76. "Assuring the Future of Software Engineering & AI Engineering," invited talk for the U.S. Naval Research Laboratory, June 27th 2023.
77. "Assuring the Future of Software Engineering and AI Engineering," invited keynote talk at the NSF and NITRD workshop on U.S. Leadership in Software Engineering & AI Engineering: Critical Needs & Priorities, Alexandria, VA, June 20th 2023.
78. "ChatGPT - The Future of the Classroom Webinar," invited presentation for the Vanderbilt Alumni Association, May 18th, 2023.
79. "Applying ChatGPT to Computer Science Courses at Vanderbilt," invited talk at the Spring AI Revolutions Symposium, Vanderbilt University, March 28th 2023.
80. "ChatGPT - Why It Matters," invited presentation for webinar for the Vanderbilt Alumni Association, March 21st, 2023.
81. "Software Construction Through Compositional Correctness," invited panelist for Scientific Soft- ware

Engineering Seminar Series: Emerging Frontiers in Software Engineering—NA4SE Panel Presentation, Sandia Labs, December 7th, 2022.

82. "Architecting the Systems of the Future: A Research Agenda," invited keynote talk at the Doctoral Symposium for the 23rd ACM/IFIP International Conference on Middleware, November 7th, 2022.
83. "Assuring Continuously Evolving Software Systems and Software Construction Through Compositional Correctness," invited panelist for the 26th International Conference on Reliable Software Technologies (AEiC 2022) 14-17 June 2022, Ghent, Belgium.
84. "Assuring Continuously Evolving Software Systems and Software Construction Through Compositional Correctness," invited panelist for the Envisioning the Future of Software Engineering Panel Session at the International Conference on Software & Systems Processes, May 20th 2022.
85. "Entering the Gray Zone: The Changing Face of Conflict," moderated a panel at the Summit on Modern Conflict and Emerging Threats, Vanderbilt University, Nashville, TN, May 5th, 2022.
86. "Architecting the Systems of the Future: A Research Agenda," invited keynote talk at the Doctoral Symposium for the 22nd ACM/IFIP International Conference on Middleware, December 6th, 2021.
87. "Cyber- and Physical-Security Risks," Southern Illinois University course on Domestic Terrorism, July 22nd, 2021.
88. "Architecting the Future of Software Engineering," invited keynote talk at the 16th International Conference on Software Technologies, July 8th, 2021.
89. "Challenges of Certifying Adaptive Dynamic Computing Environments," ARLIS Workshop, January 28th, 2021.
90. "Cyber-Security and You: Practicing Safe Surfing on the Internet," the National Active and Retired Federal Employees (NARFE) chapter, Nashville TN, January 13th, 2021.
91. "Challenges of Certifying Adaptive Dynamic Computing Environments," DARPA/SEI Software Engineering Grand Challenges and Future Visions Workshop, December 1st, 2020.
92. "Surveillance Capitalism and You," invited talk at the Southeast Science Boot Camp, Nashville, TN, May 29th, 2019.
93. "Diversify Sponsorship of Your Research: Getting Funding from the Department of Defense," Office of Research Development and Support Workshop, October 22nd, 2018, Nashville, TN.
94. "Surveillance Capitalism and You," invited talk at the Memorizing the Future: Collecting in the 21st Century Conference, Nashville, TN, October 6th, 2018.
95. "Aligning Incentives to Enable More Effective Organic Software Infrastructure for the DoD," DoD Organic Software Infrastructure Workshop, Arlington VA, August 13th, 2018.
96. "The Blockchain: What It is and Why It Matters to Us," Transforming Dermatology in the Digital Era, Memorial Sloan Kettering Cancer Center, October 25, 2018, NY, NY, USA.
97. "Aligning Incentives to Enable Modular Open Software for DoD Combat Systems," Modular Open Systems Summit, May 1st, 2018, Washington DC.
98. "The Blockchain: What It is and Why It Matters to Us," Society of Women Engineers, Vanderbilt University, March 14th, 2018.
99. "The Blockchain: What It is and Why It Matters to Us," Invited keynote at the Workshop on Middleware and Applications for the Internet of Things, (co-located with the 2017 Middleware conference in Las Vegas, USA), December 11th and 12th, 2017.
100. "The Blockchain: What It is and Why It Matters," Vanderbilt University, Nashville, TN, November 28th, 2017.
101. "The Blockchain: What It is and Why It Matters," INTERFACE Nashville conference, Nashville, TN, August 24th, 2017.
102. "Applying Blockchain to Healthcare Systems," panel presentation at the Siemens Blockchain Conference, Nuremburg, Germany, May 10th, 2017.
103. "A Primer on Big Data," Vanderbilt University Board of Trust meeting, April 21st, 2017, Nashville TN.
104. "The Past, Present, and Future of MOOCs and Their Importance for Software Engineering,"

Distinguished Lecture, University of Illinois Chicago, Chicago, IL, November 18th, 2016.

105. "Agility-at-Scale for Safety- and Mission-Critical Industrial-Scale Systems," INFORMS Annual Conference, Nashville, TN November 13th, 2016.

106. "Product Line Architectures for Open System Architectures," Varian, Winnipeg, Canada, October 7th, 2016.

107. "Agility-at-Scale for Safety- and Mission-Critical Industrial-Scale Systems," Siemens Architecture Workshop, Tarrytown, NY, September 27th, 2016.

108. "Product Line Architectures for Oncology Treatment Services," Varian, Palo Alto, CA, September 16th, 2016.

109. "Innovation and Speed: The Rise of Open Systems," the United States Technology Leadership Council, Reston, VA, August 24th, 2016.

110. "Elastic Software Infrastructure to Support the Industrial Internet," the Siemens CPS Workshop, Munich, Germany, August 1st, 2016.

111. "Challenges of Certifying Adaptive Dynamic Computing Environments," Workshop on Safety And Control for AI, Sponsored by the White House Office of Science and Technology Policy and Carnegie Mellon University, Pittsburgh, PA, June 28th, 2016.

112. "Keeping an Unfair Advantage in a Globalized and Commoditized World," Raytheon Symposium, Tucson, AZ, May 5th, 2016.

113. "Towards Technical Reference Frameworks to Support Open System Architecture Initiatives," Office of the Secretary of Defense (OSD) System of Systems Engineering Collaborators Information Exchange, December 15th 2015.

114. "Enterprise System of Systems Engineering (SoSE) Integration and Innovation," presentation at the US Marine Corp Business Management Association meeting, Quantico, VA, December 10th, 2015.

115. "An Architecture Grand Challenge: DOD's push for Open Systems Architecture," panel presentation at the Software Solutions Conference, Crystal City, VA, November 17th, 2015.

116. "Elastic Software Infrastructure to Support the Industrial Internet," the Siemens CPS Workshop, Munich, Germany, September 29th, 2015.

117. "An Overview of Mobile and mHealth Activities at ISIS and Vandy EECS," Patient Engagement Emerging Technologies, Vanderbilt University, Nashville, TN, August 10, 2015.

118. "Mobile Cloud Computing with Android," Google I/O, Mercury Intermedia Systems, Nashville, TN, May 28th, 2015.

119. "An Architecture Grand Challenge: DOD's push for Open Systems Architecture," panel presentation at the SATURN 2015 Conference, Baltimore, MD, April 27th, 2015.

120. "'Elastic Software Infrastructure to Support Computing Clouds for Cyber-Physical Systems," Dis-tinguish Lecture, Texas A&M, April 27th, 2015.

121. "Elastic Software Infrastructure to Support Computing Clouds for Cyber-Physical Systems", Boeing Distinguished Researcher And Scholar Seminar (B-DRASS) series, March 20th, Huntington Beach, CA.

122. "Elastic Software Infrastructure to Support Computing Clouds for Cyber-Physical Systems," Dis-tinguished Lecture, University of California, Irvine, February 27th, 2015.

123. "Elastic Software Infrastructure to Support Computing Clouds for Cyber-Physical Systems," Varian, Palo Alto, CA, January 15th, 2015.

124. "Keeping an Unfair Advantage in a Globalized and Commoditized World," Open Architecture Summit, Washington DC, November 4th, 2014.

125. "Proposal for a Professional Master's degree in Computer Science," invited talk at Vanderbilt University School of Engineering's Board of Visitor's meeting, October 10th, 2014.

126. "The Past, Present, and Future of Open System Architecture Initiatives," invited keynote at the Future Airborne Capabilities Environment meeting, Nashville, TN, September 24th.

127. "Future Proofing Research and Development Investments in a Globalized, Commoditized World,"

Boeing Technical Excellence Conference, May 20th, 2014, St. Louis, MO.

128. "Elastic Software Infrastructure to Support the Computing Clouds for Cyber-Physical Systems (CC4CPS)," Securboration Conference, November 12th, 2013, Melbourne, Florida.

129. "The Importance of Automated Testing in Open Systems Architecture Initiatives," Open Architecture Summit, November 12th, 2013, Washington DC.

130. Conference on Cloud and Mobile Computing, Siemens Corporate Research, Princeton, NJ, November 5th, 2013.

131. "Overview of the Technology Entrepreneurship Task Force," Innovation, Imagination, and Introductions: A Conversation with Entrepreneurs, Vanderbilt University, October 24th, 2013.

132. "Producing and Delivering a Coursera MOOC on Pattern-Oriented Software Architecture for Concurrent and Networked Software," Vanderbilt University's Faculty Senate committee on Strategic Planning and Academic Freedom, October 23rd, 2013.

133. "Elastic Software Infrastructure to Support the Industrial Internet," RTI Webinar series, October 23rd, 2013.

134. "The Importance of Applying Agility to DoD Software Initiatives," IEEE Computer Society Lockheed Martin webinar series, October 10th, 2013.

135. "Technology Entrepreneurship Task force: Charter and Progress Update," Vanderbilt University School of Engineering Board of Visitors meeting, October 4th, 2013.

136. "Stochastic Hybrid Systems Modeling and Middleware-enabled DDDAS for Next-generation USAF Combat Systems," AFOSR DDDAS PI meeting, Arlington, VA, October 1st, 2013.

137. "Producing and Delivering a Coursera MOOC on Pattern-Oriented Software Architecture for Concurrent and Networked Software," WithIT seminar, Vanderbilt University, September 12th, 2013.

138. "Applying Agility to the US Department of Defense Common Operating Platform Environment Initiatives," Interoperable Open Architecture conference, Washington DC, September 11th, 2013.

139. "Software Infrastructure Support of Computing Clouds for Cyber-Physical Systems," invited talk at Real-Time Innovations, July 31st, 2013, Sunnyvale, California.

140. "Introduction to the Institute for Software Integrated Systems," Nashville Entrepreneur Center, July 15th, 2013.

141. "Surviving the Coursera Digital Learning Experience," Coursera-in-TN Conference, Vanderbilt University, Nashville, TN, June 24th, 2013.

142. "Quo Vadis ISORC?" Panel presentation at ISORC 2013 Conference, June 19th, 2013, Paderborn, Germany.

143. "Software Infrastructure Support of Computing Clouds for Cyber-Physical Systems," invited keynote for ISORC 2013 Conference, June 19th, 2013, Paderborn, Germany.

144. "Towards Programming Models and Paradigms for Computing Clouds that Support Cyber-Physical Systems," NSF Workshop on Computing Clouds for Cyber-Physical Systems, March 15th, 2013, Ballston, VA.

145. "Built to Last: Planning Your Career as an Engineer," STEM contest on Securing Cyber Space, Brentwood High School, March 9th, 2013, Nashville, TN.

146. "Experience with Digital Learning and MOOCs at Vanderbilt," Nashville, TN, Feb 22nd, 2013.

147. "Software Design: Is It Really Better to Look Good Than to Feel Good?" World IA Day, Nashville, TN, Feb 9th, 2013.

148. "Pattern-Oriented Software Architectures: Patterns and Frameworks for Concurrent and Networked Software," PhreakNIC 2012, Murfreesboro, TN, November 9th, 2012.

149. "Applying Agility to the US Department of Defence Common Operating Platform Environment Initiatives," Interoperable Open Architecture 2012, 29 - 31 October, 2012, London, UK.

150. "Open System Architectures: Challenges and Success Drivers," OA Summit conference, Washing- ton,

DC, October 18th, 2012.

151. “Dependable Computing Clouds for Cyber-Physical Systems,” Dependability Issues in Cloud Computing Workshop, October 11th, 2012, Irvine, CA.

152. “Computing Clouds for Cyber-Physical Systems,” Reliable Cloud Infrastructure for CPS Applications Workshop, October 8th, 2012, Irvine, CA.

153. “Common Operating Platform Environments: Challenges and Success Drivers,” Navy Open Sys- tems Architecture workshop, Ballston, VA, September 27th, 2012.

154. ”Meeting the Challenges of Enterprise Distributed Real-time and Embedded Systems,” talk for Honeywell Aerospace, September 21, 2012.

155. “Architecture-Led Iterative and Incremental Development for Common Operating Platform Environments,” NITRD Software Design and Productivity meeting, National Coordination Office, Ballston, VA, July 13th, 2012.

156. ”Cyber-physical multi-core Optimization for Resource and cachE effectS,” Software-Intensive Systems Producibility workshop, Arlington VA, June 5th, 2012.

157. ”Applying Agility to DoD Common Operating Platform Environment Initiatives”, SEI Agile Research Forum, May 22nd, 2012.

158. “Meeting the Challenges of Enterprise Distributed Real-time and Embedded Systems,” keynote talk at the SATURN Conference 2012 May 7-11, 2012, St. Petersburg, FL.

159. “Reflections on 20 Years of Architecture for Distributed Real-time and Embedded Systems,” SAT- URN Conference 2012 May 7-11, 2012, St. Petersburg, FL.

160. “US Naval Open Systems Architecture Strategy,” SATURN Conference 2012 May 7-11, 2012, St. Petersburg, FL.

161. ”Towards Open Systems Architectures for Distributed Real-time and Embedded Systems,” The Center for Embedded Systems for Critical Applications, Annual Workshop, Virginia Tech, Black- burg, VA April 21st, 2012.

162. “Overview of the SEI Strategic Research Plan,” ASD(R&E) Annual Program Review, December 7th, 2011, Pittsburgh, PA.

163. “Overview of the SEI Strategic Research Plan,” Acquisition Support Program meeting, November 16th, 2011, Pittsburgh, PA.

164. “Conducting Leading-Edge Software R&D in a Globalized, Commoditized World,” NITRD Software Design and Productivity meeting, National Coordination Office, Ballston, VA, November 3rd, 2011.

165. “A Technical Assessment of Open Architecture Systems for Military Use,” Interoperable Open Architecture, 26th-28th October 2011, London, UK.

166. “Conducting Leading-Edge Software R&D in a Globalized, Commoditized World,” Technovation 2011, Carnegie Mellon University, September 29th, 2011.

167. “CTO Report,” SEI Board of Visitors Meeting, Arlington, VA, September 27th, 2011.

168. “Overview of the SEI Strategic Research Plan,” Joint Advisory Committee Meeting, Arlington, VA, September 26th, 2011.

169. ”Successful Development Efforts: Standards, People, & Culture: The Enterprise Perspective,” Software Assurance (SwA) Forum, September 16th, 2011, Arlington, VA.

170. ”Ultra-Large-Scale (ULS) Cyberphysical Systems and Their Impact on Technology and Society,” University of Salzburg, June 30th, 2011, Salzburg, Austria.

171. ”Ultra-Large-Scale (ULS) Cyberphysical Systems and Their Impact on Technology and Society,” ARTEMIS conference, June 29th, 2011, Linz, Austria.

172. ”Ultra-Large-Scale Systems and Their Impact on the DoD,” Systems and Software Technology Con-ference Committee, keynote presentation at the 23rd Systems and Software Technology Conference, May 16-19, 2011, Salt Lake City, Utah.

173. ”Ultra-Large-Scale Systems and their Impact on Technology and Society,” keynote presentation at the International Symposium on Object-Oriented Real-time Distributed Computingi/A¿ (ISORC),

Newport Beach, CA, March 29th, 2011.

174. ”Software-reliant Systems Research at the Software Engineering Institute,” Raytheon, Sudbury, MA, March 10, 2011.

175. ”Review of COE Practices,” US Army Senior Leadership Education Program, Pittsburgh, PA, January 20th, 2011.

176. ”Software Producibility for Defense,” US Army Senior Leadership Education Program, Pittsburgh, PA, January 18th, 2011.

177. ”SEI Research: The Shape of Things to Come,” ASP Meeting, Software Engineering Institute, Pittsburgh, PA, December 9th, 2010.

178. ”R&D at ASP,” ASP Air Force Training Day, Software Engineering Institute, Pittsburgh, PA, December 9th, 2010.

179. ”Software-reliant Systems Research at the Software Engineering Institute,” Siemens Corporate Research, Princeton, NJ, November 22nd, 2010.

180. ”Taming the Complexity of Software-Reliant Systems,” Software Engineering Process Group con- ference, Colombia, South America, November 11th, 2010.

181. ”SEI Technical Presentations,” Joint Advisory Committee Meeting, Arlington, VA, October 26th, 2010.

182. ”SEI Research: The Shape of Things to Come,” ASP Meeting, Software Engineering Institute, Pittsburgh, PA, October 20th, 2010.

183. ”SEI Research: The Shape of Things to Come,” SEPM Meeting, Software Engineering Institute, Pittsburgh, PA, October 19th, 2010.

184. ”Strategic Directions for Research at the SEI,” RTSS Offsite Meeting, Pittsburgh, PA, October 12th, 2010.

185. ”The World is Flat and What You Can Do About It,” Family Weekend, October 9th, 2010, Vanderbilt University.

186. ”SEI Research: The Shape of Things to Come,” SEI Board of Visitor’s Meeting, Arlington, VA, September 28th, 2010.

187. ”SEI Research: The Shape of Things to Come,” PD&T Meeting, Software Engineering Institute, Pittsburgh, PA, September 20th, 2010.

188. ”Introduction and Initial Thoughts,” RTSS Meeting, Software Engineering Institute, Pittsburgh, PA, August 19th, 2010.

189. “The Impact of Ultra-Large-Scale Systems on DoD Operations,” Congressional R&D Caucus, Ray- burn Building, Washington DC, January 19th, 2010.

190. “The World is Flat and What You Can Do About It,” Explorers meeting, January 12th, 2010, Vanderbilt University.

191. “Expectations for University - Industry Collaborative Research in CPS,” Computing Community Consortium Workshop on New Forms of Industry-Academy Partnerships in CPS Research, George Mason University, May 19th, 2009.

192. ”How Good is Your SOA?”, Panel presentation at the AFRL QED PI meeting, April 28th, 2009, Washington DC.

193. ”The World is Flat and What You Can Do About It,” ES 140, Computer Science module, October 31st, 2008, Vanderbilt University.

194. “Meeting the Challenges of Ultra-Large-Scale Distributed Real-time and Embedded Systems with QoS-enabled Middleware and Model-Driven Engineering,” Panel on Growing and Sustaining Ultra Large Scale (ULS) Systems, OOPSLA 2008, Nashville TN, October 21-23 2008.

195. ”The World is Flat and What You Can Do About It,” Family Weekend Faculty Lecture, Vanderbilt University, October 3rd, 2008.

196. “The World is Flat and What You Can Do About It,” Senior Design Seminar, Vanderbilt University, September 17th, 2008.

197. “The World is Flat and What You Can Do About It,” CS WithIT Seminar, Vanderbilt University, September 11th, 2008.

198. ”The Managed Motorway: Real-time Vehicle Scheduling - A Research Agenda,” Qualcomm, July 28th, 2008, San Diego, CA.

199. ”Meeting the Challenges of Mission-Critical Distributed Event-Based Systems with QoS-enabled Middleware and Model-Driven Engineering,” 2nd International Conference on Distributed Event- Based Systems (DEBS), Rome Italy, July 2-4, 2008.

200. ”Meeting the Challenges of Distributed Real-time and Embedded Systems with QoS-enabled Middleware and Model-Driven Engineering,” SPAWAR, April 29th, 2008.

201. ”Meeting the Challenges of Distributed Real-time and Embedded Systems with QoS-enabled Middleware and Model-Driven Engineering,” Northrop Grumman, Boulder Colorado, April 25th, 2008.

202. “Experimentation Environment for QED,” AFRL Information Management PI Meeting, April 16 2008, Georgetown, Washington, DC.

203. “Adaptive System Infrastructure for Ultra-Large-Scale Systems,” SMART Conference, Carnegie Mellon University, March 6th, 2008.

204. ”Experimentation Environment for QED”, Air Force Research Lab, Rome, NY, March 4th, 2008.

205. ”Ultra-Large-Scale (ULS) Systems and their Impact on Technology and Society,” Clemson Univer- sity, January 31st, 2008.

206. ”Meeting the Challenges of Ultra-Large-Scale Distributed Real-time and Embedded Systems with QoS-enabled Middleware and Model-Driven Engineering, invited keynote talk at Middleware 2007, Irvine, CA, November 29th, 2007.

207. ”The World is Flat and What You Can Do About It,” Senior Design Seminar, Vanderbilt University, November 14th, 2007.

208. “Technology Candidates for QED,” AFRL retreat, Minnowbrook, NY, October 23, 2007.

209. ”Overview of ISIS and Proposed IU/CRC R&D Projects,” Crystal City, VA, October 19th, 2007.

210. The Future of CORBA for Distributed Real-time and Embedded Systems, International Conference on Accelerator and Large Experimental Physics Control Systems, October 17, 2007, Knoxville, TN.

211. ”AF-TRUST: Project Overview,” Air Force Scientific Advisory Board review, Rome, NY, October 15th, 2007.

212. ”Meeting the Challenges of Distributed Real-time and Embedded Systems with Product-Line Architectures,” August 1st, 2007, Trinity College, Dublin, Ireland.

213. ”Model Driven Engineering of Product-Line Architectures for Distributed Real-time and Embedded Systems,” July 5th, 2007, University of Limerick, Ireland.

214. ”Meeting the Challenges of Mission-Critical Systems with Middleware and Model Driven Engineering”, OMG Technical Meeting, June 27, 2007, Brussels, Belgium.

215. Meeting the Challenges of Ultra-Large-Scale Distributed Real-time and Embedded Systems with Model-Driven Engineering, June 19, 2007, Trinity College, Dublin.

216. Strategic Technology Positioning, PrismTechnologies ”Middleware Fest”, June 14, 2007, Newcastle, UK.

217. ”Hurdles for Wireless Communication Systems R&D and Some Ways to Overcome Them,” OSD Workshop on Wireless Communication Systems, Rosslyn, VA, May 22nd, 2007.

218. “The World is Flat from a Computer Scientists Point of View,” Vanderbilt University Commence- ment talk, May 10th, 2007.

219. Meeting the Challenges of Ultra-Large-Scale Distributed Real-time and Embedded Systems, invited keynote at the the 10th IEEE International Symposium on Object/Component/Service-oriented Real-time Distributed Computing, May 7-9, 2007, Santorini Island, Greece.

220. “Enhanced QoS for the GIG,” AFRL JBI PI meeting, Georgetown, DC, April 24, 2007.

221. “Meeting the Challenges of Ultra-Large-Scale Distributed Real-time and Embedded Systems,” Invited keynote at the 15th International Workshop on Parallel and Distributed Real-Time Systems

(WDPRTS), March 26-27, 2007, Long Beach, California.

222. "The CORBA C++ Mapping: Beyond Repair?," OMG Meeting, San Diego, CA, March 27th, 2007.

223. "Meeting the Challenges of Ultra-Large-Scale Systems via Model-Driven Engineering," Distin- guished Lecturer Series, Florida International University, Miami, Florida, Feb 2, 2007.

224. Model Driven Engineering and QoS-enabled Component Middleware for DRE Systems, Invited talk at the European Space Agency Operations Center, Darmstadt, Germany, Wednesday January 24, 2007.

225. "Software Wind Tunnel (SWiT) Concept of Operations and System Architecture", AFRL Software and Systems Test Track workshop, Arlington, VA, January 19, 2007.

226. "Latest Breakthroughs in SDR Software Development Using Model Driven Technologies," Rockwell Collins, Cedar Rapids, IA, December 14th, 2006.

227. "Educating the DoD Workforce in a Flat World," 2006 Raytheon Integrated Defense Systems' SW Engr. Directorate Off-Site Meeting, New Castle, New Hampshire, December 7, 2006.

228. "The Ultra Challenge: Software Systems Beyond Big," panelist at OOPSLA 2006, October, 2006, Portland, OR.

229. "Software Wind Tunnel (SWiT) Architecture," AFRL Software and Systems Test Track Workshop, Cherry Hill, NJ, October 2nd, 2006.

230. "The World is Flat and What You Can Do About it," Vanderbilt University, September 12th, 2006.

231. "The World is Flat and What You Can Do About it," Vanderbilt University, September 8th, 2006.

232. "Meeting the Challenges of Ultra-Large-Scale Systems via Model-Driven Engineering," Network-Centric Operations Industry Consortium, Reston, VA, August 2nd 2006.

233. "Model Driven Architecture Roundtable," invited panelist at the Software Engineering Institute, Pittsburgh, PA, June 1st, 2006.

234. "Enhanced QoS for the GIG," AFRL Joint Battlespace Inforsphere PI meeting, Tysons Corner, VA, April 11, 2006.

235. "Model Driven Engineering for Distributed Real-time and Embedded Systems," Distinguished Lecturer Series talk at Colorado State University, Ft. Collins, CO, April 10, 2006.

236. "Win-Win Partnership of Academia and Industry: Why Should We Care? Where Is Our Common Future?" invited panelist at the 12th IEEE Real-Time and Embedded Technology and Applications Symposium April 6, 2006, San Jose, California.

237. "Meeting the Challenges of Ultra-Large-Scale Real-time Systems," invited keynote at the IEEE Real-Time and Embedded Technology and Applications Symposium April 5, 2006, San Jose, California.

238. "Model-driven Development for Distributed Real-time and Embedded Systems," ACM Meeting at Middle Tennessee State University, March 7th, 2006.

239. "Real-time, Scalable, and Secure Information Management for the GIG," Scientific Advisory Board Meeting, Rome, NY, November 16th, 2005.

240. "Real-time, Scalable, and Secure Information Management for the GIG," Airforce Research Lab, Rome, NY, November 3rd, 2005.

241. "Model-driven Development for Distributed Real-time and Embedded Systems," Distinguished Speaker Talk at BBN Technologies, Cambridge, MA, October 27, 2005.

242. "Challenges and Research Areas for QoS-enabled Information Management in Tactical Systems of Systems," AFRL Minnowbrook Workshop, Adirondack Mountains, NY, October 21st, 2005.

243. "Model-driven Development for Distributed Real-time and Embedded Systems," Invited keynote at MODELS 2005, ACM/IEEE 8th International Conference on Model Driven Engineering Languages and Systems, Half Moon Resort, Montego Bay, Jamaica, October 5-7, 2005.

244. "The World is Flat and What You Can Do About it," CS WithIT Seminar, Vanderbilt University, September 22, 2005.

245. "Why Software Reuse has Failed and How to Make it Work for You," Motorola 2005, Symposium on Software, Systems, and Simulation, Schaumburg, IL, September 16th, 2005.

246. "Pattern-Oriented Software Architecture," 12th Pattern Language of Programming Conference, Allerton Park, Illinois, September 7-10, 2005.

247. "Model-Driven Development of Distributed Real-time and Embedded Systems," 12th Pattern Language of Programming Conference, Allerton Park, Illinois, September 7-10, 2005.

248. "Model-driven Development for Distributed Real-time and Embedded Systems," Siemens Corpo- rate Research, Princeton, NJ, August 26th.

249. "Model-driven QoS Provisioning for Real-time CORBA and CCM DRE Systems," 6th OMG Real-time/Embedded CORBA workshop, Washington DC, July 11–14, 2005.

250. "A Proposed R&D Agenda for the Software Technology Laboratory," Lockheed Martin Advanced Technology Lab, Cherry Hill, NJ, June 28th, 2005.

251. "Model-Driven Development of Product-Line Architectures for DRE Systems," 11th Siemens Software Architecture Improvement Group (SAIG), Buffalo Grove, IL June 22, 2005.

252. "Business Drives for Platforms," panel at the 11th Siemens Software Architecture Improvement Group (SAIG), Buffalo Grove, IL June 22, 2005.

253. "Model Driven Development for Distributed Real-time and Embedded Systems," Lockheed Martin Advanced Technology Lab, Cherry Hill, NJ, June 15th, 2005.

254. "Approaches for Supporting Real-time QoS in JBI," JBI PI Meeting, Washington DC, May 24th, 2005.

255. "Overcoming Hurdles of Software Producibility," OSD, Software Producibility Workshop, Arlington, VA, May 18, 2005.

256. "Overview of Multi-Level Resource Management in ARMS," Fermilab, Chicago, IL, April 12th, 2005.

257. "Model Driven Middleware for Distributed Real-time and Embedded Systems," University of Southern Alabama, April 8, 2005.

258. "Model-Driven Development of Distributed Real-time and Embedded Systems," UAV Battlelab, Indian Springs, NV, February 10th, 2005.

259. "The Future of Software and Systems Engineering," IEEE Meeting, Vanderbilt University, February 8th, 2005.

260. Model Driven Development of Distributed Real-time and Embedded Systems, panel at the OOP conference, Munich, Germany, January 27, 2005.

261. "Product-line Architecture Technologies for Distributed Real-time and Embedded Systems, Lockheed Martin, Moorestown, NJ, November 11, 2004.

262. "Model Driven Development of Distributed Real-time and Embedded Systems," invited panelist in the "Generative Programming: Past, Present, and Future," at the 3rd ACM International Conference on Generative Programming and Component Engineering, Vancouver, CA, October 24th 2004.

263. "Developing Combat Systems with Component Middleware and Models," Lockheed Martin, Moorestown, NJ, October 22, 2004.

264. "Model Driven Development of Distributed Real-time and Embedded Systems," Lockheed Martin Advanced Technology Lab, Cherry Hill, NJ, October 21, 2004.

265. "Model Driven Development of Distributed Real-time and Embedded Systems," Lockheed Martin Missile and Fire Control, Dallas, TX, October 13, 2004.

266. "Design of ARMS MLRM Components: CCM Based Design for Dynamic Resource Management," DARPA ARMS Technical Interchange Meeting, Plymouth, RI, October 7, 2004.

267. "Model Driven Middleware for Component-based Distributed Systems," keynote for The 8th International IEEE Enterprise Distributed Object Computing Conference, Monterey, California, September 22, 2004.

268. "Systems Science Challenge Area," TRUST NSF Science and Technology Review, UC Berkeley, September 12, 2004.

269. "Model Driven Development for Distributed Real-time and Embedded Systems," Lockheed Martin, Eagan, MN, August 31st, 2004.

270. "Model Driven Computing for Distributed Real-time and Embedded Systems," Telcordia, Piscat- away,

NJ, August 10th, 2004.

271. "Model Driven Computing for Distributed Real-time and Embedded Systems," Raytheon, Portsmouth, RI, August 9th, 2004.

272. "Distributed Object Computing with CORBA," Raytheon, Portsmouth, RI, August 9th, 2004.

273. "Model Driven Development of Distributed Real-time and Embedded Systems," Raytheon, Ft. Wayne, IN, July 27th, 2004.

274. "Model Driven Middleware for Distributed Real-time and Embedded Systems," panelist at the 5th OMG Real-time and Embedded Middleware Workshop, Reston, VA 2004.

275. "The Role of Open Standards, Open-Source Development, and Different Development Models and Processes on Industrializing Software," ARO Workshop on Software Reliability for FCS, Vanderbilt University, Nashville, Tennessee, May 18-19, 2004.

276. "Model Driven Middleware for Distributed Real-time and Embedded Systems," Keynote talk for the SIGS Software Engineering Today conference in Zurich, Switzerland, May 4-5, 2004.

277. "Model-Driven Development of Distributed Real-time and Embedded Systems," 10th Siemens Software Architecture Improvement Group (SAIG), Vienna, Austria, April 20-24, 2004.

278. "Adaptive and Reflective Middleware for Distributed, Real-time, and Embedded Systems," Purdue University, West Lafayette, Indiana, April 6, 2004.

279. "Model Driven Middleware for Distributed Real-time and Embedded Systems," *Technologies That Will Change the World* session at the Southeastern Software Engineering Conference, Huntsville, Alabama, March 30th, 2004.

280. "Advances in COTS Middleware for Distributed Real-time and Embedded Systems," Keynote for the International Conference on COTS-Based Software Systems (ICCBSS) 2004 in Redondo Beach, February 2-4, 2004.

281. Composable Middleware Components for High Confidence Network Embedded Systems, University of California, Berkeley, December 4th, 2003.

282. "Model Driven Middleware," TechConnect 2003, St. Louis, MO, October 1st, 2003.

283. "Advances in Model Driven Middleware for Distributed Real-time and Embedded Systems," the Model Integrated Computing PSIG meeting at the OMG Technical Meeting, September 10, 2003, Boston, MA.

284. Invited panelist for the "Research on DRE Systems" panel at the OMG Real-time Middleware Workshop, July 16, 2003, Arlington, VA.

285. "Advances in Model Driven Middleware for Distributed Real-time and Embedded Systems," the OMG Real-time Middleware Workshop, July 15, 2003, Arlington, VA.

286. Organizer and presenter for a panel on "Advances in Large-scale Distributed Real-time and Embedded Systems" at the 9th IEEE Real-time/Embedded Technology and Applications Symposium (RTAS), May 27-30, 2003, Washington, DC.

287. "Managing Project Risk for Combat Systems," The Southeastern Software Engineering Conference, Huntsville, Alabama, April 1st, 2003.

288. "Distributed Real-time and Embedded Systems at DARPA," OMG Workshop on Super Distributed Objects, Washington DC, Monday, November 18, 2002.

289. "Adaptive and Reflective Middleware for Distributed Real-time Systems," Workshop on High Per- formance, Fault Adaptive, Large Scale Real-time Systems, Vanderbilt University, November 14, 2002.

290. Invited panelist on "Objects and Real-time Systems" OOPSLA '02, Seattle, WA, November 8, 2002.

291. "An Overview of ACE+TAO," Boeing, Seattle, November 8th, 2002.

292. "Pattern-Oriented Software Architecture," Amazon, Seattle, WA, November 6th, 2002.

293. "Using Real-time CORBA Effectively: Patterns and Principles," CORBA Controls Workshop, Grenoble, France, October, 9th, 2002.

294. "Adaptive and Reflective Middleware for Distributed Real-time and Embedded Systems," EMSOFT

2002: Second Workshop on Embedded Software, Grenoble, France, October, 7–9th, 2002.

295. "Designing the Future of Embedded Systems at DARPA IXO," Keynote talk at the 6th Annual Workshop on High-Performance Embedded Computing (HPEC), September 25, Boston, MA.

296. "Open Distributed Computing Platforms," NSF/OSTP Workshop on Information Technology Research for Critical Infrastructure Protection, Lansdowne, VA, September 20th, 2002.

297. "Real-time Object-Oriented Middleware," Distributed Common Ground/Surface System Technical Review Group meeting, Mclean VA, September 19th, 2002.

298. "Research Advances in Middleware for Distributed, Real-time, and Embedded Systems," Computer Communications stream of the 17th IFIP World Computer Congress, Montreal, Canada, August 25-30, 2002.

299. "DARPA Thrusts in Embedded Computing," Mercury Computer Systems, Tyngsboro, MA, July 25th, 2002.

300. "Adaptive and Reflective Middleware for Distributed, Real-time, and Embedded Combat Systems," Boeing Space and Missile Systems, Anaheim, CA, July 9, 2002.

301. "Annual Report on Software Design and Productivity Coordinating Group," Interagency Working Group, ITR&D Spring Planning Meeting, NSF, Ballston, VA, May 10, 2002.

302. "Real-time CORBA Standardization: Past, Present, and Future," panelist in the "Standards Movements in Object-oriented Real-time Computing" panel at the ISORC 2002 Conference, Washington, DC, April 30, 2002.

303. "Towards Adaptive and Reflective Middleware for Distributed Real-time Embedded Systems," Moderator of the *Distributed, Real-time, and Embedded Middleware for Network-Centric Combat Systems* panel at the Software Technology Conference (STC) in Salt Lake City, Utah, April 29, 2002.

304. "Applying Architectural Patterns to Address Key Challenges of Distributed Software," Siemens Architecture Interworking Group, Chicago, IL, April 24, 2002.

305. "Towards Adaptive and Reflective Middleware for Distributed Real-time and Embedded Systems," Space and Missile Defense Command, Huntsville, AL, April 22, 2002.

306. "How to Maintain Superiority in the Face of the Commoditization of IT," tutorial at the UCI CEO Roundtable, Maui, Hawaii, April 12, 2002.

307. "Transformation or Transmogrification? Surviving the Commoditization of IT," panelist at the UCI CEO Roundtable, Maui, Hawaii, April 11, 2002.

308. "Patterns and Principles of Mission-critical Middleware," Henry Samueli School of Engineering Research Review, University of California, Irvine, March 14th, 2002.

309. "DARPA: an Agency Overview," CRA Academic Careers Workshop, Arlington, Virginia, February 10 - 12, 2002.

310. "Towards Adaptive and Reflective Middleware for Distributed, Real-time, and Embedded Systems," Electrical Engineering and Computer Science Department, Vanderbilt University, January 28th, 2002.

311. "Protecting Critical Cyber Infrastructure from Asymmetric Threats," panelist at the 7th IEEE Workshop on Object-oriented Real-time Dependable Systems, San Diego, CA, January 10, 2002.

312. "The Researcher's Dilemma: When Technology Success Causes Great Communities to Fail (at Mission-oriented R&D Agencies)," Software Design and Productivity Coordinating Group Workshop on New Visions for Software Design and Productivity: Research and Applications, Nashville, TN, December 13-14, 2001.

313. "Towards Adaptive and Reflective Middleware for Mission-Critical Systems," Computer Science Department, William & Mary, September 7th, 2001.

314. "Adaptive and Reflective Middleware Systems," Lockheed Martin, Moorestown, NJ, August 21st, 2001.

315. "Adaptive and Reflective Middleware Systems," United Technology Research Center, Hartford, Connecticut, June 28th, 2001.

316. "Adaptive and Reflective Middleware Systems," Raytheon Annual Processing Systems Technology Network (PSTN) Symposium, Lexington, MA, June 20th, 2001.

317. Invited presenter for the Vendors' Panel at the OMG 2nd Workshop on Real-time and Embedded Distributed Object Computing, June 4-7, 2001.

318. "Towards Pattern Languages and QoS-enabled Middleware for Distributed Real-time and Embed- ded Systems," DARPA ITO workshop on Embedded Software, Lake Tahoe, NV, October 8-10, 2001.

319. "TAO, CORBA, and the HLA/RTI", Keynote talk at the Fifth IEEE International Workshop on Distributed Simulation and Real Time Applications Cincinnati, Ohio, USA August 13-15, 2001.

320. "Patterns and Principles of Middleware for Distributed Real-time and Embedded Systems," Raytheon, Sudbury, March 29th, 2001.

321. "Adaptive and Reflective Middleware Systems," Distinguished Lecture at Florida Atlantic University, Boca Raton, FL, March 1st, 2001.

322. "Adaptive and Reflective Middleware for Mission-Critical Distributed and Embedded Systems," University of Alabama, Birmingham, AL, January 31st, 2001.

323. "Adaptive and Reflective Middleware for Mission-Critical Distributed and Embedded Systems," Telcordia, Morristown, NJ, November 20th, 2000.

324. "Adaptive and Reflective Middleware for Mission-Critical Distributed and Embedded Systems," George Mason University, Fairfax, VA, November 20th, 2000.

325. "Adaptive and Reflective Middleware for Mission-Critical Distributed and Embedded Systems," Lucent CORBA Forum, Naperville, IL, November 17th, 2000.

326. "Putting an ORB on a Diet," Session on *Performance and QoS of Embedded CORBA ORBs* at the OMG's Workshop on Embedded Object-Based Systems, January 17-19, 2001.

327. "Adaptive and Reflective Middleware Systems," Panelist in a session on "Highly Distributed Systems," at the IEEE Symposium on Applications and the Internet, San Diego, CA, January 10, 2001.

328. "Adaptive and Reflective Middleware Systems," Panelist at the NSF Networking PI meeting, Irvine California, November 1st, 2000.

329. "Surviving the Tornado: The Best Kept Secrets of R&D Success in the Internet Age," Keck Observatory, Hawaii, October 9th, 2000.

330. "Adaptive and Reflective Middleware Systems," BBN Technologies, Boston, MA, September 27th, 2000.

331. "Distributed Application Integration: Myth or Reality?" Keynote talk at 2nd International Symposium on Distributed Objects and Applications (DOA '00), OMG, Antwerp, Belgium, September 21st, 2000.

332. "Surviving the Tornado: The Best Kept Secrets of R&D Success in the Internet Age," Keynote talk at 2nd International Symposium on Distributed Objects and Applications (DOA '00), OMG, Antwerp, Belgium, September 21st, 2000.

333. "High Confidence Adaptive and Reflective Middleware: Fact or Fiction?" Keynote talk for the IFIP Fourth International Conference on Formal Methods for Open Object-Based Distributed Systems, (FMOODS 2000), Stanford University, Stanford, CA, September 7th, 2000.

334. "Adaptive and Reflective Middleware Systems," Lockheed Martin, Ft. Worth, TX, September 6th, 2000.

335. Pattern-oriented Software Architecture: Concurrent and Networked Objects, Raytheon, San Diego, August 25, 2000.

336. "Adaptive and Reflective Middleware Systems," Rockwell/Collins, Cedar Rapids, Iowa, August 22, 2000.

337. "Adaptive and Reflective Middleware Systems," Lockheed Martin, Eagan, MN, August 21, 2000.

338. "Adaptive and Reflective Middleware Systems," Honeywell Technology Center, Minneapolis, MN, August 18, 2000.

339. "Adaptive and Reflective Middleware Systems," Raytheon, Falls Church, VA, July 12, 2000.

340. "Applying Patterns to Develop High-performance and Real-time Object Request Brokers," Lock-

heed Martin, Eagan, Minnesota, May 19, 2000.

341. "Patterns and Principles of Real-time Object Request Brokers," Cisco, San Jose, April 12, 2000.
342. "Patterns and Principles of Real-time Object Request Brokers," BellSouth, Atlanta, Georgia, March 3, 2000.
343. "Patterns and Principles of Real-time Object Request Brokers," Distinguished Lecturer Series, Michigan State University, East Lansing, Michigan, October 21, 1999.
344. "Towards Minimum ORBs for Wireless Devices and Networks," OPENSIG '99 Workshop, Carnegie Mellon University, Pittsburgh, October, 14-15, 1999.
345. "Applying CORBA Fault Tolerant Mechanisms to Network Management," Lucent CORBA Forum, Naperville, IL, September 28th, 1999.
346. "CORBA for Real-time and Embedded Telecom Systems," Lucent CORBA Forum, Naperville, IL, September 28th, 1999.
347. "Patterns and Principles of Real-time Object Request Brokers," BEA, Munich, Germany, September 16th, 1999.
348. "Real-time CORBA – Fact or Fiction," Siemens CORBA Day, Munich, Germany, September 15th, 1999.
349. "Patterns and Principles of Real-time Object Request Brokers," Siemens MED, Erlangen, Germany, September 13th, 1999.
350. "Patterns and Principles of Real-time Object Request Brokers," RT DII COE TWG, Boeing, Seattle, WA August 25th, 1999.
351. "Patterns for Real-time Middleware," Microsoft, Redmond, WA, August 24th, 1999.
352. "Patterns and Principles of Real-time Object Request Brokers," Lockheed Martin, Eagan, Minnesota, June 22nd, 1999.
353. "Using the ACE Framework and Patterns to Develop OO Communication Software," Dreamworks SGK, Glendale, CA, May 5th, 1999.
354. "Why Telecom Reuse has Failed and how to Make it Work for You," Keynote talk at Nortel Design Forum, Ottawa, CA, April 22nd, 1999.
355. "QoS-enabled Middleware for Monitoring and Controlling High-Speed Networks and Endsystems," Lucent Bell Labs, Murray Hill, NJ, April 15th, 1999.
356. "Optimization Patterns for High-performance, Real-time Object Request Broker Middleware," University of California, Irvine, April, 2nd, 1999.
357. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent, Columbus, OH, March 18-19 and 25-26, 1999.
358. "Using Design Patterns, Frameworks, and Object-Oriented Communication Systems," Lucent, Holmdel, NJ, March 1-4, 1999.
359. Chaired a panel on "Research Directions for Middleware," NSF PI meeting, Washington, DC, January 24th, 1999.
360. "Principles and Patterns of High-performance Real-time CORBA," University of Southern California, Los Angeles, CA, December 10th, 1998.
361. "Real-time CORBA for Telecom – Fact or Fiction?" Bellcore, Morristown, NJ, December 1st, 1998.
362. "Design Patterns for Real-time Object Request Brokers," Silicon Valley Patterns Group, San Francisco, November 15, 1998.
363. "Why Reuse has Failed and how to Make it Work for You," Keynote talk at Lucent Software Symposium, October 27th, Murray Hill, NJ, 1998.
364. "Real-time CORBA – Fact or Fiction," Lucent CORBA Forum, Holmdel, NJ, September 29, 1998.
365. "Applying Software Design Patterns and Framework to Telecommunication Applications," Nortel Advanced Software Computing and Technology, Monday, April 6, 1998, Ottawa, Canada.

366. "Patterns and Performance of Real-time Object Request Brokers," University of California, Santa Barbara, February 20, 1998.

367. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of Frankfurt, Germany, February 12th, 1998.

368. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of Illinois, Urbana-Champaign November 12th, 1997.

369. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of Missouri, Kansas City, October 31st, 1997.

370. "Principles and Patterns of High-performance, Real-time Object Request Brokers," IBM T.J. Watson Research, September 15, 1997.

371. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of California, Santa Barbara, August 21st, 1997.

372. "Principles and Patterns of High-performance, Real-time Object Request Brokers," Lucent Technologies, Naperville, IL August 19th, 1997.

373. "Mastering Software Complexity with Reusable Object-Oriented Frameworks, Components, and Design Patterns," 3rd NSA Software Reuse Symposium, August 20th, 1997.

374. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of Utah, Salt Lake City, Utah, August 11th, 1997.

375. "Using the ACE Framework and Design Patterns to Develop Object-Oriented Communication Software," CERN, Switzerland, July 18th, 1997.

376. "Principles and Patterns of High-performance, Real-time Object Request Brokers," CHOOSE symposium, Zurich, Switzerland, July 17th, 1997.

377. Invited keynote speaker for 2nd Component's User Conference, Munich Germany, July 1997.

378. "Principles and Patterns of High-performance, Real-time Object Request Brokers," Lucent Bell Laboratories, Murray Hill, New Jersey, July 9th, 1997.

379. "Using the ACE Framework and Design Patterns to Develop Object-Oriented Communication Software," Lockheed Martin Tactical Systems, Minneapolis, Minnesota, June 26th, 1997.

380. "QoS for Distributed Object Computing Middleware – Fact or Fiction?" panel at the Fifth International Workshop on Quality of Service (IWQoS '97), May 22nd, 1997, Columbia University, NYC, USA.

381. "Design Patterns and Frameworks for Developing Object-oriented WWW Clients and Servers," Carleton University, April 11th, 1997.

382. "Principles and Patterns of High-performance, Real-time Object Request Brokers," University of Maryland, College Park, Maryland, April 2nd, 1997.

383. "A High-Performance End system Architecture for Real Time COBRA," SPARTAN Symposium sponsored by US Sprint, Lawrence Kansas, March 18th, 1997.

384. "Experience with CORBA for Communication Systems," Motorola, Chicago, January 24th, 1997.

385. "High-performance CORBA," Bay Area Object Interest Group, Stanford Linear Accelerator Center, California, December 5th, 1996.

386. "Gigabit CORBA – An Architecture for High-performance Distributed Object Computing," Numerical Aerodynamic Simulation group, NASA, Moffett Field, California, December 3rd, 1996.

387. "Towards High-performance, Real-time CORBA," Distinguished Lecturer at Kansas State University, Manhattan, Kansas, November 7th, 1996.

388. "Gigabit CORBA – An Architecture for High-performance Distributed Object Computing," University of California, Los Angeles, October 3rd, 1996.

389. "Design Patterns and Frameworks for Object-Oriented Communication Software," NSA Software Reuse Symposium, August 28th, 1996.

390. "CORBA – the Good, the Bad, and the Ugly," Lucent Bell-Labs, Naperville, IL, August 22nd, 1996.

391. "Components: the Good, the Bad, and the Ugly," keynote talk for the 1st Components Users

Conference, SIEMENS, Munich, Germany, July 15th, 1996.

392. "Design Patterns for Object-Oriented Communication Software," IONA Technologies, Ltd, Dublin, Ireland, July 12th, 1996.

393. "OO Design Patterns and Frameworks for Communication Software," Siemens Corporate Research, Princeton, New Jersey, June 27, 1996.

394. "OO Design Patterns for Concurrent, Parallel, and Distributed Systems," IBM Centre for Advanced Studies, North York, Ontario, Canada, June 17, 1996.

395. "Distributed Object Computing with CORBA", Bell Laboratories, Murray Hill, New Jersey, June 11-12th, 1996.

396. "Design Patterns for Object-Oriented Communication Software," Carleton University, Ottawa, Canada, May 21st, 1996.

397. "Integrating LAN-WAN-Celestial Networks with Design Patterns," Featured technical session at the Object World East conference, Boston, MA, May 9th, 1996.

398. "Using Design Patterns to Develop Object-Oriented Communication Software Frameworks and Applications," McMaster's University, Hamilton, Canada, May 2nd, 1996.

399. "Towards Gigabit CORBA – A High-Performance Architecture for Distributed Object Computing," University of Nevada, Reno, April 25th, 1996.

400. "Domain Analysis: From Tar Pit Extraction to Object Mania?" Panelist at the 4th International Conference on Software Reuse, Orlando, Florida, April 25th, 1996. (other panelists include Spencer Peterson, SEI CMU, Mark Simos, Organon Motives Inc., Will Tracz, Loral, and Nathan Zalman, BNR Inc).

401. "Concurrent Object-Oriented Network Programming with C++," Kodak Imaging Technology Center, April 19th, 1996.

402. "Using OO Design Patterns and Frameworks to Develop Object-Oriented Communication Sys- tems," INRS/NorTel Workshop on Telecommunication Software, Montreal, CA, March 14th, 1996.

403. "Concurrent Object-Oriented Network Programming with ACE and C++," for Siemens Medical Engineering, Erlangen Germany, February 15th, 1996.

404. "OO Componentware" Panelist at the *OOP '96 Conference*, SIGS, Munich, Germany, February 13st, 1996. (other panelists included Michael Stal (Siemens AG) and Frank Buschmann (Siemens AG).

405. "Using Design Patterns to Develop High-performance Object-Oriented Communication Software Frameworks," for the Department of Information Systems, Institute of Computer Science, Johannes Kepler University of Linz, Austria, February 12th, 1996.

406. "The Performance of Object-Oriented Components for High-speed Network Programming," for the Digital Libraries research group at Stanford University, Palo Alto California, February 2nd, 1996.

407. "Distributed Object Computing with CORBA, ACE, and C++," for Southwestern Bell Telephone advanced distributed systems group, St. Louis, MO., January 26th, 1996.

408. "OO Design Patterns for Large-Scale Object-Oriented Communication Software Systems," AG Communication Systems, Phoenix, Arizona, December 11 –13th, 1995.

409. "Experience Using OO Design Patterns to Develop Large-Scale Object-Oriented Communication Software Systems," Bell Northern Research, 7th Annual Design Forum, Ottawa, Canada, December 6th, 1995.

410. "Using OO Design Patterns to Develop Large-Scale Distributed Systems," Object Technology International, Ottawa, Canada, November 22nd, 1995.

411. "Design Patterns for Concurrent, Parallel, and Distributed Systems," North Dallas Society for Object Technology, September 13th, 1995.

412. "Using Design Patterns for Iridium Communication Services," at Motorola Iridium, Chandler, AZ, June 30th, 1995.

413. "Object Technology and the World-Wide Information Infrastructure," Panelist at ECOOP '95, Aarhus, Denmark, August 9th, 1995.

414. "Measuring the Performance of CORBA over ATM Networks," HP Labs, Palo Alto, CA, June 28th, 1995.
415. "Measuring the Performance of Object-Oriented Components for High-speed Network Programming," The C++ and C SIG user group, New York, New York, June 5th, 1995.
416. "An Overview of Design Patterns for Object-Oriented Network Programming," St. Louis Chapter of the ACM, St. Louis, MO, March 13th 1995.
417. "Design Patterns for Concurrent Object-Oriented Network Programming," Distributed Systems group at Siemens Corporate Research Center, Munich, Germany, March 3rd, 1995.
418. "Patterns: 'Eureka,' 'Deja-Vu,' or 'Just Say No' ?" Panelist at the *OOP '95 Conference*, SIGS, Munich, Germany January 31st, 1995. (other panelists included Richard Helm, (DMR), Frank Buschmann (Siemens AG), and Dave Thomas (OTI).
419. "Developing Distributed Applications with the ADAPTIVE Communication Environment," *The* 12th *Annual Sun Users Group Conference*, SUG, San Francisco, California, June 17th, 1994.
420. "Flexible Configuration of High-performance Distributed Communication Systems," presented at the ETH-Zentrum in the Swiss Federal Institute of Technology, Zurich, Switzerland, May 31st, 1994.
421. "Object Oriented Techniques for Developing Distributed Applications," *Computer Science Department Colloquia*, California State University Northridge, December 7th, 1993.
422. "Hosting the ADAPTIVE System in the *x*-Kernel and System V STREAMS," *The x-Kernel Work- shop*, IEEE, Tucson, Arizona, November 10th, 1992.
423. "An Environment for Controlled Experimentation on the Performance Effects of Alternative Transport System Designs and Implementations," IBM T. J. Watson Research Center, Hawthorne, New York, September 10th, 1992.

Colloquia, Seminars, and Tutorials

1. "The Democratization of Computational Thinking: Case Studies of AI Agentic Problem Solving," William & Mary Alumni Association's Lifelong Learning Program, August 25th, 2026.
2. "The Democratization of Computational Thinking: Case Study of AI-Augmented Problem Solving, William & Mary Alumni Association's Lifelong Learning Program, July 16th, 2026.
3. "The Democratization of Computational Thinking: Education, Practice, & Our AI-Augmented Future," William & Mary Alumni Association's Lifelong Learning Program, June 17th, 2026.
4. "Programming with Java Lambdas and Streams," O'Reilly Live Training, May 3rd, 2022.
5. "Design Patterns in Java," O'Reilly Live Training, April 28th and 29th, 2022.
6. "Scalable Reactive Programming with Java," O'Reilly Live Training, February 2nd, 2022.
7. "Programming with Java Lambdas and Streams," O'Reilly Live Training, December 6th, 2021.
8. "Design Patterns in Java," O'Reilly Live Training, November 15th and 16th, 2021.
9. "Scalable Reactive Programming with Java," O'Reilly Live Training, September 9th, 2021.
10. "Design Patterns in Java," O'Reilly Live Training, September 1st and 2nd, 2021.
11. "Programming with Java Lambdas and Streams," O'Reilly Live Training, July 20th, 2021.
12. "Scalable Reactive Programming with Java," O'Reilly Live Training, May 17th, 2021.
13. "Scalable Reactive Programming with Java," O'Reilly Live Training, January 22nd, 2021.
14. "Programming with Java Lambdas and Streams," O'Reilly Live Training, January 13th, 2021.
15. "Design Patterns in Java," O'Reilly Live Training, November 12th and 13th, 2020.
16. "Design Patterns in Java," O'Reilly Live Training, September 17th and 18th, 2020.
17. "Programming with Java Lambdas and Streams," O'Reilly Live Training, September 14th, 2020.
18. "Core Java Synchronizers," O'Reilly Live Training, August 20th, 2020.
19. "Scalable Reactive Programming with Java," O'Reilly Live Training, August 19th, 2020.

20. “Programming with Java Lambdas and Streams,” O’Reilly Live Training, June 1st, 2020.
21. “Design Patterns in Java,” O’Reilly Live Training, May 27th and 28th, 2020.
22. “Core Java Synchronizers,” O’Reilly Live Training, May 18th, 2020.
23. “Programming with Java Lambdas and Streams,” O’Reilly Live Training, March 30th, 2020.
24. “Design Patterns in Java,” O’Reilly Live Training, March 23rd and 24th, 2020.
25. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, February 24th, 2020.
26. “Core Java Synchronizers,” O’Reilly Live Training, February 10th, 2020.
27. “Design Patterns in Java,” O’Reilly Live Training, January 29th and 30th, 2020.
28. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, January 22nd, 2020.
29. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, January 22nd, 2020.
30. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, November 27th, 2019.
31. “Reactive Programming with Java 8 CompletableFutures,” O’Reilly Live Training, November 18th, 2019.
32. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, November 6th, 2019.
33. “Design Patterns in Java,” O’Reilly Live Training, November 4th and 5th, 2019.
34. “Design Patterns in Java,” O’Reilly Live Training, September 17th and 18th, 2019.
35. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, September 3rd, 2019.
36. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, August 29th, 2019.
37. “Reactive Programming with Java 8 CompletableFutures,” O’Reilly Live Training, August 15th, 2019.
38. “Design Patterns in Java,” O’Reilly Live Training, July 29th and 30th, 2019.
39. “Reactive Programming with Java 8 CompletableFutures,” O’Reilly Live Training, August 15th, 2019.
40. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, July 2nd, 2019.
41. “Design Patterns in Java,” O’Reilly Live Training, June 13th and 14th, 2019.
42. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, May 16th, 2019.
43. “Reactive Programming with Java 8 CompletableFutures,” O’Reilly Live Training, May 13th, 2019.
44. “Design Patterns in Java,” O’Reilly Live Training, April 17th and 18th, 2019.
45. “Scalable Programming with Java 8 Parallel Streams,” O’Reilly Live Training, March 27th, 2019.
46. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, March 12th, 2019.
47. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, March 5th, 2019.
48. “Design Patterns in Java,” O’Reilly Live Training, February 26th and 27th, 2019.
49. “Reactive Programming with Java 8 CompletableFutures,” O’Reilly Live Training, February 19th, 2019.
50. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, February 5th, 2019.
51. “Programming with Java 8 Lambdas and Streams,” O’Reilly Live Training, January 22nd, 2019.
52. “Design Patterns in Java,” O’Reilly Live Training, January 7th and 8th, 2019.
53. “Scalable Concurrency with the Java Executor Framework,” O’Reilly Live Training, December 11th, 2018.

54. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, December 6th, 2018.
55. "Design Patterns in Java," O'Reilly Live Training, November 13th and 14th, 2018.
56. "Scalable Concurrency with the Java Executor Framework," O'Reilly Live Training, October 29th, 2018.
57. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, October 16th, 2018.
58. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, October 4th, 2018.
59. "Design Patterns in Java," O'Reilly Live Training, September 18th and 19th, 2018.
60. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, September 4th, 2018.
61. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, August 30th, 2018.
62. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, August 20th, 2018.
63. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, July 25th, 2018.
64. "Design Patterns in Java," O'Reilly Live Training, July 2nd and 3rd, 2018.
65. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, June 26th, 2018.
66. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, June 25th, 2018.
67. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, June 8th, 2018.
68. "Design Patterns in Java," O'Reilly Live Training, May 24th and 25th, 2018.
69. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, April 26th, 2018.
70. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, April 17th, 2018.
71. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, April 13th, 2018.
72. "Design Patterns in Java," O'Reilly Live Training, April 3rd, 2018.
73. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, March 13th, 2018.
74. "Scalable Programming with Java 8 Parallel Streams: Part 2," O'Reilly Live Training, March 7th, 2018.
75. "Scalable Programming with Java 8 Parallel Streams: Part 1," O'Reilly Live Training, March 6th, 2018.
76. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, March 1st, 2018.
77. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, February 13th, 2018.
78. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, February 6th, 2018.
79. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, February 1st, 2018.
80. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, January 12th, 2018.
81. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, January 10th, 2018.
82. "Reactive Programming with Java 8 CompletableFutures," O'Reilly Live Training, January 9th, 2018.
83. "Reactive Programming with Java 8 Completable Futures," O'Reilly Live Training, October 23rd, 2017.
84. "Programming with Java 8 Lambdas and Streams," O'Reilly Live Training, October 19th, 2017.
85. "Scalable Programming with Java 8 Parallel Streams," O'Reilly Live Training, October 17th, 2017.
86. "Java 8 Concurrency," O'Reilly Live Training, September 7-8th, 2017.
87. "Java 8 Concurrency," O'Reilly Live Training, August 30-31st, 2017.

88. "Java 8 Concurrency," O'Reilly Live Training, June 28-29th, 2017.
89. "The C++ Standard Template Library," Qualcomm, San Diego, February 16-19, 2016.
90. "The C++ Standard Template Library," Qualcomm, San Diego, October 13-16, 2015.
91. "The C++ Standard Template Library," Qualcomm, San Diego, October 13-16, 2015.
92. "Pattern-Oriented Java Concurrency," InformIT Webinar, May 14th, 2015.
93. "Pattern-Oriented Concurrent Programming with Java," OOP Conference, Munich, Germany, January 30th, 2015.
94. "Concurrent Programming in Android," OOP Conference, Munich, Germany, January 29th, 2015.
95. "The C++ Standard Template Library," Qualcomm, San Diego, October 14-17, 2014.
96. "The C++ Standard Template Library," Qualcomm, San Diego, August 5-8, 2014.
97. "Pattern-Oriented Software Architecture for Concurrent and Networked Software," July 28-31, 2014.
98. "The C++ Standard Template Library," Qualcomm, San Diego, August 5-8, 2014.
99. "The C++ Standard Template Library," Qualcomm, India, March, 2014.
100. "The C++ Standard Template Library," Qualcomm, San Diego, CA, January 23-34, 2014.
101. "The C++ Standard Template Library," Qualcomm, San Diego, CA, October 16-17th, 2013.
102. "Patterns and Frameworks for Concurrent and Networked Software," 2013 International Summer School on Trends in Computing Tarragona, Spain, July 25-26, 2013.
103. "The C++ Standard Template Library," Qualcomm, San Diego, CA, January 23-24th, 2013.
104. "The C++ Standard Template Library," Qualcomm, San Diego, CA, October 4-5th, 2012.
105. "Embedded Systems Patterns for C Developers," Qualcomm, San Diego, CA, August 28th, September 11th, September 25th, October 9th, October 23rd, and November 6th, 2012.
106. "Embedded Systems Patterns for C Developers," Qualcomm, San Diego, CA, August 14-15th, 2012.
107. "The C++ Standard Template Library," Qualcomm, San Diego, CA, May 15-18th, 2012.
108. "The C++ Standard Template Library," Qualcomm, San Diego, CA, January 25-26th, 2012.
109. "Object-Oriented Software Patterns and Frameworks," Qualcomm, San Diego, CA, October 11-12th, 2011.
110. "The C++ Standard Template Library," Qualcomm, San Diego, CA, May 11-12th, 2011.
111. "The C++ Standard Template Library," Qualcomm, San Diego, CA, January 25-26, 2011.
112. "Pattern-Oriented Software Architecture: A Pattern Language for Concurrent and Networked Software," SPLASH 2010, October 17-21, 2010, Reno, Nevada.
113. "Pattern-Oriented Software Architectures - Patterns and Frameworks for Concurrent and Net- worked Software," ProObject, Hanover, MD, August 11th, 2010.
114. "Pattern-Oriented Software Architecture: Patterns for Concurrent and Networked Embedded Sys- tems," Qualcomm, Bangalore, India, June 21-22, 2010.
115. "Pattern-Oriented Software Architecture: Patterns for Concurrent and Networked Embedded Sys- tems," Qualcomm, Hyderabad, India, June 24-25, 2010.
116. "Pattern-Oriented Software Architecture: A Pattern Language for High Quality and Affordable Distributed Computing Systems," IEEE Webinar Series, June 10th, 2010.
117. "The C++ Standard Template Library," Qualcomm, San Diego, CA, May 12-13, 2010.
118. "The C++ Standard Template Library," Qualcomm, San Diego, CA, December 16-17, 2009.
119. "Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing," OOPSLA 2009, Orlando, FL, October, 2009.
120. "The C++ Standard Template Library," Qualcomm, San Diego, CA, September 15-16, 2009.

121. "Networked Embedded Systems Patterns for C Developers," Qualcomm, San Diego, CA, June 11-12, 2009.
122. "Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing," Software Architecture Technology Users' Network (SATURN) workshop May 5, 2009 in Pittsburgh, PA.
123. "The C++ Standard Template Library," Qualcomm, San Diego, CA, January 29-30, 2009.
124. "Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing," IEEE Webinar Series, January 8th, 2009.
125. "Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing," OOPSLA 2008, Nashville, TN, October 20, 2008.
126. "The Data Distribution Service for Real-time Systems," OOPSLA 2008, Nashville, TN, October 19, 2008.
127. "Object-Oriented Patterns for Concurrent and Networked Applications," Qualcomm, San Diego, CA, August 5-6th, 2008.
128. "The C++ Standard Template Library," Qualcomm, San Diego, NJ, July 29-30, 2008.
129. "Object-Oriented Patterns and Frameworks with C++," Qualcomm, San Diego, CA, June 12-13, 2008.
130. "The C++ Standard Template Library," Qualcomm, New Jersey, May 5-6, 2008.
131. "Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing," Software Architecture Technology Users' Network (SATURN) workshop April 28 - May 1, 2008 in Pittsburgh, PA.
132. Developing Distributed Computing Systems with Patterns and Middleware, UCLA Extension, February 19-21, 2008.
133. Pattern-Oriented Software Architecture: A Pattern Language for Distributed Computing, OOPSLA 2007, Montreal, CA, October 24, 2007.
134. Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware, Qual- comm, New Jersey, September 27-28, 2007.
135. Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware, Qual- comm, San Diego, CA, August 21-22, 2007.
136. Lightweight CORBA Component Model, 8th OMG Real-time/Embedded CORBA workshop, Washington DC, July 9–12, 2007.
137. Model-Driven Engineering for Distributed Real-time and Embedded Systems, 13th IEEE Real- Time and Embedded Technology and Applications Symposium (RTAS 2007), Bellevue, WA, United States April 3-6, 2007.
138. "Improving Product Reliability and ROI Through Effective Software Reuse," Qualcomm, San Diego, CA, March 27th, 2007.
139. "Developing Distributed Computing Systems with Patterns and Middleware," UCLA Extension, February 21-23, 2007.
140. "POSA: Patterns for Concurrent and Distributed Systems," OOP, Munich, Germany, January 22, 2007.
141. "Meeting the Challenges of Software-Intensive Embedded Systems," OOP, Munich, Germany, January 23, 2007.
142. "Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware," Qualcomm, San Diego, CA, January 10-11, 2007.
143. "Model-Driven Development of Distributed Systems," OOPSLA 2006, Portland, OR, October 22- 26, 2006.
144. "Pattern-Oriented Software Architecture: Patterns for Concurrent and Networked Objects," OOPSLA 2006, Portland, OR, October 22-26, 2006.
145. "Model-Driven Engineering of Distributed Systems," MODELS 2006, Genova, Italy, October 1, 2006.

146. "Distributed Real-time and Embedded Systems," Advanced Institute of Information Technology, Seoul, Korea, August 7-11 2006.
147. "Lightweight CORBA Component Model," 7th OMG Real-time/Embedded CORBA workshop, Washington DC, July 10–13, 2006.
148. "How to Use ACE Effectively," Trion World Network, Austin, TX, June 19-21, 2006.
149. "Improving Product Reliability and ROI Through Effective Software Reuse," Qualcomm, San Diego, CA, June 15, 2006.
150. "Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware," Qualcomm, San Diego, CA, June 13-14, 2006.
151. "Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware," Qualcomm, San Diego, CA, Feb 9-10, 2006.
152. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, University of California, Los Angeles Extension, January 18-20st, 2006."
153. "Model Driven Development of Distributed Real-time and Embedded Systems," at the OOP con- ference, January 17, 2006, Munich, Germany.
154. "Pattern-Oriented Software Architecture," at the OOP conference, January 16, 2006, Munich, Germany.
155. "Model Driven Development: State of the Art," at the OOP conference, January 16, 2006, Munich, Germany.
156. "Concurrent C++ Network Programming with Patterns and Frameworks," C++ Connections: 20 Years of C++ conference, November 11, 2005, Mandalay Bay, Las Vegas, NV.
157. "Pattern-Oriented Software Architecture: Patterns for Concurrent and Distributed Systems," OOPSLA 2005, San Diego, October 17th, 2005.
158. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," BAE Systems, Greenlawn, New York, August 25, September 2-3.
159. "Lightweight CORBA Component Model," 6th OMG Real-time/Embedded CORBA workshop, Washington DC, July 11–14, 2005.
160. "Model Driven Development for Distributed Real-time and Embedded Systems," OMG Information Days: MDA - Frankfurt, Germany, June 9th, 2005
161. "Model Driven Development for Distributed Real-time and Embedded Systems," OMG Information Days: MDA - Munich, Germany, June 7th, 2005.
162. "Model Driven Development for Distributed Real-time and Embedded Systems," OMG Information Days: MDA - Zurich, Switzerland, June 1st, 2005.
163. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," BAE Systems, Wayne, New Jersey, May 13, 16, 19, 23, 27, 2005.
164. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," BAE Systems, Wayne, New Jersey, February 18th, February 22nd, March 1, 8, and 15 2005.
165. "Pattern-Oriented Software Architectures for Distributed Systems" the OOP conference, January 28, 2005, Munich, Germany.
166. "Research on Model Driven Development of Distributed Real-time and Embedded Systems," the OOP conference, January 26, 2005, Munich, Germany.
167. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, January 19-21st, 2005.
168. atterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, BAE Systems, Wayne, New Jersey, October 29, November 1, 8, 15, 22, 2004.
169. "Pattern-Oriented Software Architectures for Distributed Systems," OOPSLA 2004, Vancouver, British Columbia, October 25th, 2004.
170. "Notes on the Forgotten Craft of Software Architecture", OOPSLA 2004, Vancouver, British Columbia, October 25th, 2004.

171. "Model Driven Architecture with QoS-enabled component middleware," MDE for Embedded Systems, Brest, France, September 10th 2004.
172. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Qualcomm, San Diego, CA, Jan 7-6, 2005.
173. "Object-Oriented Design and Programming with Patterns, Frameworks, and Middleware," Qualcomm, San Diego, CA, Jan 9-10, 2005.
174. "Using the Lightweight CORBA Component Model to Develop Distributed Real-time and Embedded Applications," OMG Workshop on Distributed Object Computing for Real-time and Embedded Systems, July 12th, 2004, Reston, VA.
175. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, July 7-9th, 2004.
176. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, University of California, Los Angeles Extension, January 21st-23rd, 2004.
177. Patterns and Frameworks for Concurrent Distributed Systems, SIGS OOP Conference, Munich, Germany, January 19th, 2004.
178. Middleware for Distributed Real-time and Embedded Systems, SIGS OOP Conference, Munich, Germany, January 19th, 2004.
179. "Pattern-Oriented Software Architectures for Networked and Concurrent Applications," OOPSLA 2003, Anaheim, CA, October 27, 2003.
180. The JAOO 2003 conference, September 22-26, Aarhus, Denmark.
181. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, July 9-11th, 2003.
182. "Patterns, Frameworks, and Middleware: Their Synergistic Relationship," Frontiers of Software Practice, International Conference on Software Engineering, Portland, Oregon, May 7, 2003.
183. "Pattern-Oriented Distributed Systems Architecture," International Conference on Software Engineering, Portland, Oregon, May 5, 2003.
184. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, January 22nd-24th, 2003.
185. "Patterns and Application Experiences for Real-time Object Request Brokers," OOPSLA 2002, Seattle, Washington, November, 2002.
186. "Pattern-Oriented Software Architectures for Networked and Concurrent Applications," OOPSLA 2002, Seattle, Washington, November, 2002.
187. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, Raytheon, St. Petersburg, FL, September 3–5, 2003.
188. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, University of California, Los Angeles Extension, July 22nd-24th, 2002.
189. "Policies and Patterns for High-performance, Real-time Object Request Brokers," Mercury Com- puter Systems, Tysons Corner, VA, November Feb 7, 2002.
190. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, University of California, Los Angeles Extension, January 23rd-25th, 2002.
191. "Policies and Patterns for High-performance, Real-time Object Request Brokers," Raytheon, Ross- lyn, VA, November 12th, 2001.
192. "Pattern-Oriented Software Architecture: Patterns for Concurrent and Networked Objects," OOPSLA 2001, October 15th, 2000, Minneapolis, Minnesota.
193. "Policies and Patterns for High-performance, Real-time Object Request Brokers," International Symposium on Distributed Object Applications (DOA), Rome, September 17-20, 2001.
194. "Policies and Patterns for QoS-enabled Middleware," The JAOO 2001 conference, September 10-14, Aarhus, Denmark.
195. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication

Systems," University of California, Los Angeles Extension, July 23rd-25th, 2001.

196. "Policies and Patterns for High-performance, Real-time Object Request Brokers," OMG Second Workshop on Real-time and Embedded Distributed Object Computing on June 4-7, 2001 in Hern- don, VA, USA.

197. "Design Patterns for Understanding Middleware and Component Infrastructures," 6th USENIX Conference on Object-Oriented Technologies and Systems, January 29, 2001, San Antonio, TX.

198. "Principles and Patterns of High-performance, Real-time Object Request Brokers," OOP conference, Munich, Germany, January 23, 2001.

199. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, January 3-5, 2001.

200. "Patterns for Concurrent and Distributed Objects," OOPSLA 2000, October 16th, 2000, Minneapolis, Minnesota.

201. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Berkeley Extension, May 24-26, 2000.

202. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Jet Propulsion Laboratory, Pasadena, CA, April 2000.

203. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Los Angeles Extension, March 27-31, 2000.

204. "Optimizing Middleware to Support High-Performance Real-time Distributed and Embedded Systems," OOP conference, Munich, Germany, January 27, 2000.

205. "Effective Architectures for DOC," OOP conference, Munich, Germany, January 24, 2000.

206. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California, Berkeley Extension, December 13-15, 1999.

207. "Middleware Techniques and Optimizations for Real-time Embedded Systems," 12th International Symposium On System Synthesis, IEEE, San Jose, CA, USA, November 11, 1999

208. "Patterns and Principles of Real-time Object Request Brokers," OOPSLA 1999, ACM, Denver, Colorado, November 1-5, 1999.

209. "Using Design Patterns, Frameworks and CORBA to Reduce the Complexity of Developing Reusable Large-Scale Object-Oriented Concurrent Communication Components and Systems," Fifth IEEE International Conference on Engineering of Complex Computer Systems, Las Vegas, Nevada, October 18-21, 1999

210. "Distributed Technologies," Motorola, Schaumburg, IL, August 10-12, 1999.

211. "Patterns and Principles of Real-time Object Request Brokers," the 3rd Components Users Conference, SIEMENS, Munich, Germany, July 12th, 1999.

212. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent, Naperville, IL, June 23-24 and June 30 - July 1st, 1999.

213. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Motorola Software Symposium, Ft. Lauderdale, Florida, June 21st, 1999.

214. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California Los Angeles Extension, June 2-4, 1999.

215. "Concurrent Object-Oriented Network Programming and Distributed Object Computing," University of California Berkeley Extension, May 19-21, 1999.

216. "Patterns and Principles of Real-time Object Request Brokers," 5th USENIX Conference on Object-Oriented Technologies and Systems, May 4, 1999, San Diego, CA.

217. "Real-time CORBA for Telecom – Fact or Fiction?" Nortel Design Forum, Ottawa, CA, April 22, 1999.

218. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent, Columbus, OH, March 18-19 and 25-26, 1999.

219. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent, Holmdel, NJ, March 1-4, 1999.

220. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent/Octel, Milpitas, CA, December 14-16, 1998.

221. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California Los Angeles Extension, December 8-10, 1998.

222. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Motorola, Schaumburg, IL, December 2-4, 1998.

223. "Concurrent Object-Oriented Network Programming and Distributed Object Computing," University of California Berkeley Extension, November 16-18, 1998.

224. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Software," OOPSLA 1998, October 19th, 1998, Vancouver, British Columbia.

225. "High-Performance CORBA," Lucent CORBA Forum, Holmdel, NJ, September 29, 1998.

226. "Writing Efficient Multi-Thread CORBA Applications," the 3rd Components Users Conference, SIEMENS, Munich, Germany, July 10, 1998.

227. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Software," UCLA extension course, Milan, Italy, June 29 - July 1, 1998.

228. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," Lucent, Naperville, IL, June 8-11, 1998.

229. "Patterns and Performance of Real-time Object Request Brokers," Fourth IEEE Real-Time Tech-nology and Applications Symposium (RTAS), Denver, Colorado, June 5, 1998.

230. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California Los Angeles Extension, June 1-3, 1998.

231. "Patterns and Principles of Real-time Object Request Brokers," NSA, Ft. Meade, MD, March 22, 1998.

232. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, Crosskeys, Ottawa Canada, March 19-21, 1998.

233. "Concurrent Object-Oriented Network Programming and Distributed Object Computing," University of California Berkeley Extension, March 4-6, 1998.

234. "Building Distributed Communication Software with CORBA," the Motorola Systems Symposium, February, 1998, Austin, Texas, USA.

235. "Introduction to Distributed Objects with CORBA," SIGS OOP '98, February 9-13, 1998, Munich, Germany.

236. "Design Patterns for Developing and Using CORBA Object Request Brokers," SIGS OOP '98, February 9-13, 1998, Munich, Germany.

237. Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems, Lucent Technologies, Whippany, NJ, January 5-6, 1998.

238. "Using Design Patterns, Frameworks, and CORBA to Develop Object-Oriented Communication Systems," University of California Los Angeles Extension, December 10-12, 1997.

239. "Concurrent Object-Oriented Network Programming and Distributed Object Computing," University of California Berkeley Extension, December 10-12, 1997.

240. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Systems," Motorola Cellular Infrastructure Group, Arlington Heights, Illinois, December 1 - 3, 1997.

241. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Systems," TOOLS Pacific '97, Melbourne, Australia November 24 - 27, 1997.

242. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Systems" for the IEEE GLOBECOM '97 conference, Phoenix, AZ, November 4-8, 1997.

243. "High-performance Distributed Object Computing with CORBA," IEEE International Conference on Network Protocols, Atlanta, GA, October 28th, 1997.

244. "Using Design Patterns and Frameworks to Develop Object-Oriented Communication Systems," OOPSLA 1997, ACM, Atlanta, GA, October 6-7th, 1997.

245. "Using Design Patterns and Frameworks to Develop Object-oriented Communication Systems," 24th International Conference on Technology of Object-Oriented Languages and Systems (TOOLS Asia '97). Beijing, China, September 22, 1997.

246. "Principles and Patterns of Distributed Object Computing Systems," for the ACM Principles of Distributed Computing Conference (PODC), Santa Barbara, CA, August 21st, 1997.

247. "Distributed Object Computing with CORBA and ACE," Alta Software, Jacksonville, FL, June 4-5th, 1997.

248. "Distributed Object Computing with CORBA", Object Expo, NY, NY, June 2nd, 1997.

249. "Concurrent Object-Oriented Network Programming and Distributed Object Computing," University of California Berkeley Extension, May 28-30, 1997.

250. "Patterns and Principles of Real-time Object Request Brokers," National Security Agency, Ft. Meade, MD, May 13th, 1997.

251. "Building Distributed Communication Software with CORBA," the Motorola Systems Symposium, March, 1997, Chandler, AZ, USA.

252. "Evaluating Concurrency Models for CORBA Servers," the 2nd Components Users Conference, SIEMENS, Munich, Germany, July 14th, 1997.

253. "Design Patterns for Evolving System Software Components from UNIX to Windows NT," the 2st Components Users Conference, SIEMENS, Munich, Germany, July 14th, 1997.

254. "Techniques and Patterns for Distributed Object Computing with CORBA and C++," University of California Berkeley Extension, December 4-6, 1996.

255. "Design Patterns for Concurrent Object-Oriented Programming with ACE and C++," C++ World, Dallas, TX, November 11th, 1996.

256. "Implementing Concurrent CORBA Applications with Multi-Threaded Orbix and ACE," C++ World, Dallas, TX, November 12th, 1996.

257. "Why Reuse has Failed, and How You Can Make it Work for You," Berne Technology Forum 1996, Berne, Switzerland, October 18, 1996.

258. "Introduction to Distributed Object Programming with CORBA," the Local Computer Networks '96 conference, IEEE, Minneapolis, Minnesota, October 13, 1996.

259. "Object-Oriented Design Patterns for Concurrent, Parallel, and Distributed Systems," the OOPSLA 1996 conference, ACM, San Jose, California, October, 1996.

260. "OO Design Patterns Network Programming in C++," Object Expo Europe, London, England, September 23rd, 1996.

261. "Effective Multithreaded CORBA Programming," Object Expo Europe, London, England, September 24th, 1996.

262. "Workshop on Object Oriented Technologies," Mitsubishi, July 22nd to July 26th, 1996, Kobe, Japan.

263. "Evaluating Concurrency Models for CORBA Servers," the 1st Components Users Conference, SIEMENS, Munich, Germany, July 15th, 1996.

264. "Design Patterns for Evolving System Software Components from UNIX to Windows NT," the 1st Components Users Conference, SIEMENS, Munich, Germany, July 15th, 1996.

265. "OO Design Patterns for Concurrent, Parallel, and Distributed Systems," the 2nd *Conference on Object-Oriented Technology*, USENIX, Toronto, Canada, June 17, 1996.

266. "OO Design Patterns for Concurrent, Parallel, and Distributed Systems," the 3rd *Conference on Object-Oriented Technology*, USENIX, Portland, Oregon, June 16th, 1996.

267. "OO Design Patterns for Network Programming in C++," the *Object Expo '96 Conference*, SIGS, Sydney, Australia, June 3rd, 1996.

268. "Effective Multi-threaded CORBA Programming," the *Object Expo '96 Conference*, SIGS, Sydney, Australia, June 5th, 1996.

269. "Concurrent Object-oriented Network Programming with C++," University Of California Berkeley Extension, Berkeley, California, May 22nd –24th, 1996.

270. "Experience Developing Reusable Software Using Object-Oriented Design Patterns and Frameworks," the 4th *International Conference on Software Reuse*, Orlando, Florida, USA April 23-26, 1996.
271. "Techniques for Object-Oriented Network Programming," the *OOP Conference*, SIGS, Munich, Germany, Feb 14th, 1996.
272. "Using Object-Oriented Design Patterns to Develop Large-Scale Distributed Systems," the *OOP Conference*, SIGS, Munich, Germany, Feb 13th, 1996.
273. "Concurrent Object-oriented Network Programming with C++," University Of California Berkeley Extension, Berkeley, California, November 30th-December 1st, 1995.
274. "Using Object-Oriented Design Patterns to Develop Large-Scale Distributed Systems," the 4th *C++ World Conference*, SIGS, Chicago, Illinois, October 31st, 1995.
275. "Techniques for Object-Oriented Network Programming," the 4th *C++ World Conference*, SIGS, Chicago, Illinois, October 31st, 1995.
276. "Experience using OO Design Patterns to Develop Large-scale Distributed Communication Systems," *OOPSLA 1995 Conference* in Austin, Texas, October 1995.
277. "Concurrent Object-oriented Network Programming with C++," the 9th *European Conference on Object-Oriented Programming (ECOOP)*, Aarhus, Denmark, August, 1995.
278. "Concurrent Object-Oriented Network Programming with C++," the 1st *Conference on Object-Oriented Technology*, USENIX, Monterey, California, June 23, 1995.
279. "Design Patterns for Concurrent and Distributed Systems," the *Object Expo '95 Conference*, SIGS, New York, NY, June 5th 1995.
280. "Object Oriented Network Programming," the *Object Expo '95 Conference*, SIGS, New York, NY, June 5th, 1995.
281. "Software Construction with Active Objects in C++," the *OOP '95 Conference*, SIGS, Munich, Germany January 31, 1995.
282. "Object-Oriented Concurrent Programming with C++," the *OOP '95 Conference*, SIGS, Munich, Germany January 31, 1995.
283. "Concurrent Object-Oriented Programming," the *Winter USENIX Conference*, USENIX, New Orleans, Louisiana, January, 1995.
284. "Object-Oriented Network Programming with C++," the 3rd *C++ World Conference*, SIGS, Austin, Texas, November 14, 1994.
285. "Object-Oriented Techniques for Dynamically Configuring Concurrent Distributed Applications," the 9th *OOPSLA 1994*, ACM, Portland, Oregon, October 23, 1994.
286. "Object-Oriented Network Programming," the 6th *C++ Conference*, USENIX, Cambridge, Massachusetts, April 11, 1994.
287. "Object-Oriented Techniques for Developing Extensible Network Servers," the 2nd *C++ World Conference*, SIGS, Dallas, Texas, October 19, 1993.

Professional Activities

Editorial Activities

1. Guest co-editor for a special issue of the MDPI Journal Computing and Artificial Intelligence on "Generative AI: From Theory to Applications," 2026, with Dana Zhang.
2. Guest co-editor for a special issue of the Springer Journal Annals of Telecommunications on "Middleware for Internet distribution in the context of Cloud Computing and the Internet of Things," 2016, with Gordon Blair and Chantal Taconet.
3. Guest co-editor of the Proceedings of the IEEE special issue on Applications of Augmented Reality Environments, 2014.
4. Guest co-editor of the International Journal of Network Protocols and Algorithms (NPA) Special Issue on Data Dissemination for Large scale Complex Critical Infrastructures, 2010.
5. Wrote the foreword to the book *Patterns of Parallel Software Design* by Jorge Luis Ortega Arjona,

Wiley, 2010.

6. Editorial board member of the Springer Journal of Internet Services and Applications (JISA).
7. Editorial board member of the Transactions on Pattern Languages of Programming (TPLoP) published by Springer-Verlag.
8. Wrote the foreword to the book *Practical Software Factories in .NET*, by Gunther Lenz and Christoph Wienands, Apress, 2006.
9. Guest editor of the IEEE Computer Special Issue on Model Driven Development, February 2006.
10. Guest co-editor of IEEE Network special issue on "Middleware Technologies for Future Communication Networks," February 2004 (co-editors with Gordon Blair and Andrew Campbell).
11. Editorial board member of the Springer Journal of Aspect-Oriented Software Development.
12. Wrote the foreword to the book *Fundamentals of Distributed Object Systems: The CORBA Per- spective*, by Zahir Tari and Omran Bukhres, Wiley and Sons, 2001.
13. Wrote the foreword to the book *Design Patterns in Communication Software*, edited by Linda Rising, Cambridge University Press, 2000.
14. Guest editor of the Special Issue on Components and Patterns for *The Journal of Theory and Practice of Object Systems*, Wiley & Sons, to appear 2002.
15. Invited editorial on "Trends in Distributed Object Computing" for the special issue on Distributed Object-Oriented Systems appearing in the Parallel and Distributed Computing Practices journal, edited by Maria Cobb and Kevine Shaw, Vol. 3, No. 1, March 2000.
16. Co-editor of "Building Application Frameworks: Object-Oriented Foundations of Framework Design," John Wiley & Sons, 1999 (co-editors are Mohamed Fayad and Ralph Johnson), ISBN 0-471-24875-4.
17. Co-editor of "Implementing Application Frameworks: Object-Oriented Frameworks at Work," John Wiley & Sons, 1999 (co-editors are Mohamed Fayad and Ralph Johnson), ISBN 0-471-25201-8.
18. Guest editor of the Special Issue on OO Application Frameworks for the Communications of the ACM, (co-editor Mohamed Fayad), ACM, October, 1997.
19. Guest editor of the special issue on Distributed Object Computing for USENIX Computing Systems Journal, November/December, 1996.
20. Guest editor of a feature topic on Distributed Object Computing for IEEE Communications Mag-azine, February, 1997.
21. Wrote the foreward for Dr. Nayeem Islam's book on *Distributed Objects: Methodologies for Customizing Operating Systems* (IEEE Computer Society Press, 1996).
22. Guest editor of the Special Issue on Patterns and Pattern Languages for Communications of the ACM, (co-editors Ralph Johnson and Mohamed Fayad), ACM, October, 1996.
23. Co-editor of a book entitled "Pattern Languages of Program Design," Addison-Wesley, 1995 (co-editor Jim Coplien, Bell Labs).
24. Editor of the Patterns++ section of the C++ Report Magazine, April 1997 - March 1998.
25. Editor-in-chief of the C++ Report Magazine, January 1996 - February 1997.
26. Editorial board member of the IEEE Computer Society - Computer Science & Engineering Practice Board.

Program Chairmanships and Conference Organization

1. Chair of the DoD Organic Software Infrastructure Workshop, Arlington VA, August 13th, 2018.
2. General Chair of the Software Product Line Conference, Nashville TN, July/August, 2015.
3. Program Chair of the Interoperable Open Architecture 2013 conference, September 10-11, 2013, Washington, DC.
4. Program Chair of the NSF Workshop on Computing Clouds for Cyber-Physical Systems, March 15th, 2013, Ballston, VA.

5. Program Chair of the Interoperable Open Architecture 2012 conference, October 29-31, 2012, London, UK.
6. Program co-chair for the 1st International Symposium on Secure Virtual Infrastructures (DOA-SVI'11), 17-19 Oct 2011, Crete, Greece.
7. Program co-chair for the COMmunication System softWAre and middleware (Comsware) conference, Helsinki, Finland, August 2010.
8. Doctoral symposium chair for OOPSLA 2009, Orlando Floria, October 25-29, 2009.
9. General co-chair for the 3rd ACM International Conference on Distributed Event-Based Systems (DEBS 2009), July 6-9, 2009 - Nashville, TN, USA.
10. Member of the ISORC 2009 advisory and publicity committee for ISORC 2009, March 17-20, 2009, Toyko, Japan.
11. Area Coordinator for the Integrating Systems of Systems using Services topic at the 6th International Conference on Service Oriented Computing, Sydney (Australia), December 1st - 5th, 2008.
12. Member of the Advisory and Publicity Committee for ISORC 2008, Orlando, Florida, May 5 -7, 2008.
13. Co-chair of the Middleware for Network Eccentric and Mobile Applications (MiNEMA.08) Work- shop co-located with ACM EuroSys Conference, March 31 - April 1, 2008, Glasgow, Scotland.
14. General chair of the ACM/IEEE 10th International Conference on Model Driven Engineering Languages and Systems (MODELS 2007), Nashville TN, September 30-October 5, 2007.
15. Area co-coordinator for the Quality-of-Service research track at The Fifth International Con- ference on Service-Oriented Computing, September 17-20, 2007, Vienna, Austria.
16. Program co-chair of the NSF workshop on New Research Directions in Composition and Systems Technology for High Confidence Cyber Physical Systems, July 9, 2007.
17. Program co-chair for the Science of Design Principal Investigators workshop, February 28 to March 2, 2007.
18. Program co-coordinator for SOA Runtime area of the 4th International Conference on Service Oriented Computing Chicago, USA, December 4-7, 2006.
19. Program co-chair of the NSF/NCO Workshop on High-Confidence Software Platforms for Cyber- Physical Systems (HCSP-CPS) Workshop systems, November 30th to December 1st, 2006, Alexan- dria, VA.
20. Panels chair for the MoDELS 2006 conference, Genova Italy, Oct. 2-6, 2006.
21. Program Co-Chair of the Generative Programming and Component Engineering (GPCE) Conference, Portland, OR, October 2006 (collocated with OOPSLA '06).
22. Program Chair of the NSF/NCO Workshop on New Research Directions in High Confidence Software Infrastructure for Distributed Real-time and Embedded (DRE) systems, July 10th, 2006, Fairfax VA.
23. Program Co-Chair of the NSF/NCO High Confidence Medical Device Software and Systems (HCMDSS) Workshop, May 2005, University of Pennsylvania, Philadelphia, Pennsylvania.
24. Track Vice Chair for Real-time Middleware and Software Engineering for the Real-time Systems Symposium, Lisbon, Portugal, December, 2004.
25. Program Co-chair for the NSF/NCO Planning Meeting for the High Confidence Medical Device Software and Systems (HCMDSS) Workshop, November 16-17, 2004, Arlington, VA.
26. Program chair for 19th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOSPLA), October 24-28, 2004, Vancouver, British Columbia, Canada.
27. General co-chair of the IEEE Real-Time and Embedded Technology and Applications Symposium, May 25 – 28, 2004, Toronto, Canada.
28. Program chair of the CCM Workshop, December 10th, 2003, Nashville, TN.
29. General co-chair for the 5th International Symposium on Distributed Objects and Applications, November 3–7 2003, Catania, Sicily.

30. Program co-chair of the 3rd TAO Workshop, July 18, 2002, Arlington, VA.
31. Program co-chair for Middleware 2003, 4th IFIP/ACM/USENIX International Conference on Distributed Systems Platforms, June 16-20, 2003, Rio de Janeiro, Brazil.
32. Program co-chair for the 9th IEEE Real-time/Embedded Technology and Applications Symposium (RTAS), May 27-30, 2003, Washington, DC.
33. Area vice-chair and session chair for Middleware at the 23rd IEEE International Conference on Distributed Computing Systems (ICDCS), May 19-22nd, 2003, Providence, RI.
34. Program co-chair of the IEEE Workshop on LargeScale Real-Time and Embedded Systems, De-cember 2, 2002, Austin, TX.
35. Program co-chair for the 4th International Symposium on Distributed Objects and Applications, October 28–November 1, 2002, Irvine, CA.
36. Co-organizer of the cross-agency Software Design and Productivity Coordinating Group Workshop on New Visions for Software Design and Productivity: Research and Applications, December 13-14, Nashville, TN.
37. Program co-chair for the 3rd International Symposium on Distributed Objects and Applications, September 18-20, 2001, Rome, Italy.
38. Co-organizer of the cross-agency Workshop on New Visions for Software Design and Productivity, April 18-19, 2000, Ballston, VA.
39. Area vice-chair and session chair for Middleware at the IEEE International Conference on Distributed Computing Systems, April 16-19, Phoenix, AZ, 2001.
40. Tutorial chair for the 6th USENIX Conference on Object-Oriented Technologies and Systems, January 27 - February 3, 2001, San Antonio, TX.
41. Co-chair of the OMG Workshop on Real-time and Embedded CORBA, in Reston, VA, July 24-27, 2000.
42. General chair of the IFIP/ACM International Conference Middleware 2000 in New York, April, 2000.
43. Tutorial chair for the 5th USENIX Conference on Object-Oriented Technologies and Systems, May 3-7, 1999, San Diego, CA.
44. Treasurer for the Fourth International Workshop on Object-oriented Real-time Dependable Systems (WORDS'99) January 27-29, 1999, Radisson Hotel, Santa Barbara, California, USA.
45. Tutorial chair for the 4th USENIX Conference on Object-Oriented Technologies and Systems, April 27-30, 1998, Santa Fe, New Mexico.
46. Co-chair of the mini-track on Engineering Client-Server Systems for the HICSS-31 conference, the Big Island of Hawaii - January 6-9, 1998.
47. Tutorial chair for the 3rd USENIX Conference on Object-Oriented Technologies and Systems, Portland, OR, June 1997.
48. Publicity chair for the 5th IEEE International Workshop on Object-Orientation in Operating Systems, IEEE TCOS and USENIX, Seattle, Washington, October 27-28, 1996.
49. Program chair for 3rd conference on Programming Languages of Programming, Allerton, IL, USA, September, 1996.
50. Program chair for the 2nd USENIX Conference on Object-Oriented Technologies, June 1996.

Professional Service and Advisory Positions

1. Member of the US Air Force VICEROY advisory board.
2. Member of the Pioneering Artificial Intelligence in Research (PAIR) Advisory Group for Pioneer Academics.
3. Member of the William & Mary Veteran-to-Executive Transition (W&M VET) Advisory Group.
4. Member of the steering committee of the Assurance Evidence fo Continuously-Evolving Real-Time Systems (ASERT) Workgroup.
5. Member of the Fraunhofer Advisory Board for the University of Maryland, College Park.
6. Past member of the steering committee for the Software Product-Line Conference series.

7. Past member of the Future Airborne Capabilities Environment (FACE) Advisory Board.
8. Past Vice-Chair of the Cyber Situation Awareness study for the Air Force Scientific Advisory Board.
9. Past Member of the Joint Tactical Radio System (JTRS) Tiger Team in support of the Assistant Secretary of the Army, Acquisition, Logistics, and Technology.
10. Past Member of the Air Force Scientific Advisory Board.
11. Past Member of the advisory board for the NSF-sponsored Repository for Model-Driven Development (ReMoDD) project at Colorado State University.
12. Past Member of the National Academics Committee on Advancing Software-Intensive Systems Producibility, chaired by Bill Scherlis from Carnegie Mellon University (CMU).
13. Member of the Engineering and Methods Technical Advisory Group (TAG) for the Software Engineering Institute at Carnegie Mellon University (CMU) from 2006 to 2009.
14. Past Member of the Ultra-Large-Scale (ULS) Systems study commissioned by the US Army and conducted at the Software Engineering Institute at Carnegie Mellon University (CMU).
15. Past Member of the Joshua group, which is an advisory board for the Air Force Research Lab (AFRL) in Rome, NY.
16. Past Member of the steering committee for the Distributed Objects and Applications conference series.
17. Past Member of the steering committee for the ACM/USENIX/IFIP Middleware conference series.
18. Past Member of the steering committee for EMSOFT 2002: Second Workshop on Embedded Software, Grenoble, France, October, 7–9th, 2002.
19. Member of the steering committee for EMSOFT 2001: First Workshop on Embedded Software, Lake Tahoe, California, October, 8th–10th, 2001.
20. Past Member of the Board of Directors for the Embedded Systems Consortium for Hybrid and Embedded Research (ESCHER).
21. Past Member of the NASA/JPL Mars Science Laboratory Mission Concept Review Board.
22. Chair of the subcommittee on Embedded and Hybrid Systems program for the National Science Foundation's 2003 Committee of Visitors in the Computer and Communications Research (C-CR) Division.
23. Past Co-chair of the Software Design and Productivity (SDP) Coordinating Group of the Federal government's multi-agency Information Technology Research and Development (IT R&D) Program, the collaborative IT research effort of the major Federal science and technology agencies. The SDP Coordinating Group formulates the multi-agency research agenda in fundamental software design.
24. One of the three founding members of the Scientific Advisory Board for the *International Symposium of Distributed Objects and Applications* conference series.
25. Past Member of the advisory board for Entera, which provides Internet content delivery systems based on ACE.
26. Invited to participate in the OO Working Group of the "Strategic Directions in Computing Research" workshop sponsored by ACM at MIT in June 1996.

Technical Program Committees

1. The International Conference on Agentic, Generative, and Cognitive AI Systems (AGCS 2026), Paris, France, October 27–30, 2026.
2. The 13th International Conference on Artificial Intelligence (ICOAI 2026), Paris, France, September 25-27, 2026.
3. The 30th Ada-Europe International Conference on Reliable Software Technologies (AEiC 2026), June 2026, in Västerås, Sweden.
4. The Middleware for Autonomous AIoT Systems in the Computing Continuum (MAIOT'25) as part of ACM Middleware conference, Nashville, TN, December 15th-19th, 2025.
5. The 12th International Conference on Artificial Intelligence (ICOAI 2025), Paris, France, October

27-29, 2025.

6. Journal track of Ada-Europe International Conference on Reliable Software Technologies (AEiC 2025), Paris, France, June 2025.
7. International Workshop on Envisioning the AI-Augmented Software Development Life Cycle at the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (FSE'25) Workshops Program, June 2025, Trondheim, Norway.
8. Journal track of the 28th Ada-Europe International Conference on Reliable Software Technologies (AEiC 2024), Barcelona, Spain, June 2024.
9. IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2023), 25-29th, September, 2023, Toronto, Canada.
10. Work-in-progress track, Ada-Europe 2023 conference, 13-16 June 2023, in Lisbon, Portugal.
11. Middleware 2022 Doctoral Symposium, Nov. 7-11, 2022 in Quebec Canada.
12. The 3rd IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2022) held virtually from 19th to 23rd September 2022.
13. The 16th ACM International Conference on Distributed and Event-Based Systems, June 27 to July 1, 2022, Copenaghen, Denmark.
14. 8th International Workshop on Middleware and Applications for the Internet of Things (M4IoT), held in December 2021 in conjunction with the ACM/IFIP International Middleware Conference.
15. Middleware 2021 Doctoral Symposium, Dec. 6-10, 2021 in Quebec Canada.
16. The 2nd IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2021), September 27 to October 1, 2021, Washington DC, USA.
17. "Web of Things, Ubiquitous and Mobile Computing" Track for the Web Conference 2021, Ljubljana, Slovenia, from April 19-23, 2021.
18. 7th International Workshop on Middleware and Applications for the Internet of Things (M4IoT), December 2020 in conjunction with the ACM/IFIP International Middleware Conference.
19. 14th ACM International Conference on Distributed and Event-based Systems, July 13 to July 17, 2020, in Montreal, Quebec, Canada.
20. The Web Conference 2020: Web of Things, Ubiquitous, and Mobile Computing Track, April 20- 24th, 2020, Taipei, Taiwan.
21. 6th Middleware for Context-Aware Applications in the IoT (M4IOT) workshop collocated with the ACM/IFIP/USENIX Middleware 2019 Conference, UC Davis, California, USA, December 9-13th 2019.
22. IEEE Workshop on IoT Big Data and Blockchain, at the 2019 IEEE International Conference on Big Data (IEEE Big Data 2019), December 9-12, 2019, Los Angeles, CA, USA.
23. The Second International Workshop on Blockchain Dependability, in conjunction with SRDS2019, Lyon, France, October 1, 2019.
24. The 13th ACM International Conference on Distributed and Event-based Systems, 4th-28th June, 2019, Darmstadt, Germany.
25. The "Web of Things, Ubiquitous, and Mobile Computing" track of The Web Conference 2019, San Francisco, CA, USA, May 13–17, 2019.
26. 17th Workshop on Adaptive and Reflexive Middleware (ARM), collocated with ACM/IFIP/Usenix Middleware 2018, December 10-14th, 2018, Rennes, France.
27. 25th International Conference on Pattern Languages of Programs (PLoP 2018), October 23 – 26th, Portland, OR, USA.
28. First International Workshop on Blockchain Dependability (WBD2018), held in conjunction with the 14th European Dependable Computing Conference, 10-14 September 2018, Iasi, Romania.
29. Workshop on Designing Resilient Intelligent Systems for Testability and Reliability, April 30 – May 4, 2018 in Seattle, USA (co-located with ICSA 2018).
30. 15th IEEE International Conference on Autonomic Computing (ICAC 2018), Sept 3-7, 2018,

Trento, Italy.

31. International Conference on Information Society and Smart Cities (ISC 2018), Oxford city, United Kingdom 06-07 June, 2018.
32. 16th Workshop on Adaptive and Reflective Middleware workshop collocated with the ACM/IFIP/ USENIX Middleware 2017 Conference, Las Vegas, Nevada, Dec 11-15, 2017.
33. 4th Middleware for Context-Aware Applications in the IoT (M4IOT) workshop collocated with the ACM/IFIP/USENIX Middleware 2017 Conference, Las Vegas, Nevada, Dec 11-15, 2017.
34. 10th International Workshop on Dynamic Software Product Lines - Adaptive Systems through Runtime Variability (DSPL '17), Sept 25-29, 2017, Sevilla, Spain.
35. 11th ACM International Conference on Distributed and Event-Based Systems (DEBS 2017), June 19 - 23, 2017, Barcelona, Spain.
36. 3rd Middleware for Context-Aware Applications in the IoT (M4IOT) workshop collocated with the ACM/IFIP/USENIX Middleware 2016 Conference, December 12-16, 2016 - Trento, Italy.
37. 7th International Symposium On Leveraging Applications of Formal Methods, Verification and Validation, October 5th – 14th, 2016, Corfu, Greece.
38. 10th ACM International Conference on Distributed and Event-based Systems, June 20 to June 24, 2016 in Irvine, CA.
39. First International Workshop on Science of Smart City Operations and Platforms Engineering (SCOPE), April 11, 2016, Vienna, Austria (Co-located with CPS Week).
40. 9th Dynamic Software Product Lines (DSLP) 2015 (held as part of SASO 2015) at MIT on September 21, 2015.
41. 13th International Conference on Advances in Mobile Computing and Multimedia (MoMM2015), Brussels, Belgium from 10-12 December 2015.
42. 13th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing (EUC 2015, track on Cyber Physical Systems, Porto Portugal, October 21-23, 2015.
43. 35th IEEE International Conference on Distributed Computing Systems (ICDCS), June29 - July 2, 2015 in Columbus, Ohio, USA.
44. Fourth International Conference on Emerging Applications of Information Technology (EAIT) at Indian Statistical Institute, Kolkata, India, December 19-21, 2014.
45. The 20th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2014), Berlin, Germany, April 2014.
46. International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2014), Lisbon, Portugal, 7-9 January, 2014.
47. 14th ACM/IFIP/USENIX International Middleware Conference (Middleware 2013), December 9- 13, Beijing, China.
48. 32nd International Symposium on Reliable Distributed Systems (SRDS 2013), September 30- October 3, 2013 at Braga, Portugal.
49. 17th International Software Product Line Conference SPLC, Tokyo, Japan, 26-30 August 2013.
50. First International Workshop on Engineering Mobile-Enabled Systems, in conjunction with ICSE 2013, May 18-26th, 2013, San Francisco, CA.
51. International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2013), Barcelona, Spain, 19-21 February, 2013.
52. ACM/USENIX/IFIP International Middleware conference, Montreal, Quebec, Canada, December 3-7, 2012.
53. 11th Workshop on Adaptive and Reflective Middleware, in conjunction with Middleware 2012 in Montreal, Quebec, Canada, December 3-7, 2012.
54. International Workshop on Real-Time and Distributed Computing in Emerging Applications (RE- ACTION) 2012, San Juan, Puerto Rico, December 4, 2012, in co-location with the 33rd IEEE Real-Time Systems Symposium.

55. Third International Conference on Emerging Applications of Information Technology (EAIT) Novem- ber 29 - December 01, 2012, Kolkata, India.
56. IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS), Las Vegas, USA, November 12 - 14, 2012.
57. 31st International Symposium on Reliable Distributed Systems (SRDS), 8th-11th October 2012. Irvine, California.
58. Sixth International Workshop on Dynamic Software Product Lines (DSPL), September 2 - 7, 2012, Salvador, Brazil.
59. 16th International Software Product Line Conference (SPLC 2012), Salvador, Brazil on 02-07 September 2012.
60. 5th International workshop UML and Formal Methods (UML&FM 2012), Paris, France, August 27-31, 2012.
61. UML&AADL 2012, July 18-20,2012, Ecole Normale Superieure, Paris, France.
62. 17th IEEE International Conference on Engineering of Complex Computer Systems (ICECCS 2012), July 18-20,2012, Ecole Normale Superieure, Paris, France.
63. COMPSAC 2012 - Trustworthy Software Systems for the Digital Society, July 16-20, 2012, Izmir, Turkey.
64. Foundations Track of the 8th European Conference on Modelling Foundations and Applications (ECMFA 2012), Copenhagen, Denmark, 2-6th of July, 2012.
65. 24th International Conference on Software Engineering and Knowledge Engineering, Redwood City, California, USA, July 1-3, 2012.
66. 12th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS'12), Stockholm, Sweden, 13-16 June 2012.
67. 15th IEEE International Symposium on Object and component-oriented Real-time distributed Computing (ISORC), April 11-13, 2012, Shenzhen, China.
68. 23rd IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS 2011), Dallas, USA, December 14 to 16, 2011.
69. Fourth IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2011), December 12th–14th 2011, University of California, Irvine, CA.
70. ACM/IFIP/USENIX International Middleware Conference, Lisbon, Portugal, December 12th to 16th, 2011.
71. 9th International Conference on Advances in Mobile Computing and Multimedia (MoMM2011), Hue City, Vietnam, 05-07 December 2011.
72. Control Systems, Automation and Robotics track of the 3rd International Congress on Ultra Modern Telecommunications and Control Systems (ICUMT 2011), Hungary on October 5-7, 2011.
73. 15th IEEE International Enterprise Distributed Object Computing Conference (EDOC 2011), August 29th - September 2nd, 2011, Helsinki, Finland.
74. 15th International Software Product Line Conference (SPLC 2011), Research/Experience Track, Munich, Germany, August, 22-26, 2011.
75. 15th International Software Product Line Conference (SPLC 2011), Industry Track, Munich, Germany, August, 22-26, 2011.
76. 2nd Workshop on Formal Methods in Software Product Line Engineering - Munich (Germany), August 2011.
77. 23rd International Conference on Software Engineering and Knowledge Engineering (SEKE2011), Miami Beach, USA, July 7-9, 2011.
78. 2nd International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems, July, 5th 2011, Porto, Portugal.
79. Fourth IEEE International workshop UML and Formal Methods, co-located with FM 2011, June 20th, 2011, Lero, Limerick, Ireland.

80. The Software Engineering and Data Engineering (SEDE 2011) conference, Las Vegas, Nevada, June 20-22, 2011.
81. 3rd International Workshop on Model-Driven Architecture and Modeling-Driven Software Devel- op- ment (MDA&MDSD 2011) in conjunction with the 6th International Conference on Evaluation of Novel Approaches to Software Engineering - ENASE 2011, Beijing Jiaotong University, 8-11, June 2011.
82. 11th International IFIP Conference on Distributed Applications and Interoperable Systems (DAIS 2011), Reykjavik, Iceland, June 6-9 2011.
83. Second Product LinE Approaches in Software Engineering (PLEASE) workshop, collocated with 33rd International Conference on Software Engineering, Waikiki, Honolulu, Hawaii, May 21-28, 2011.
84. 16th Annual IEEE International Conference on the Engineering of Complex Computer Systems (ICECCS), April 27th-29th, 2011 Las Vegas, NV, USA.
85. Sixth IEEE International workshop UML and AADL, in conjunction with ICECCS 2011, April 27th, 2011, Las Vegas, USA.
86. First International Workshop on Cyber-Physical Networking Systems (CPNS'2011), in conjunction with INFOCOM 2011, April 15, 2011, Shanghai, China.
87. 2nd Workshop on Model Based Engineering for Embedded System Design (M-BED 2011), colo- cated with the Design, Automation, and Test in Europe (DATE) conference, 14-18, March, 2011, Grenoble, France.
88. Second International Conference on Emerging Applications of Information Technology (EAIT 2011), February, 2011 at Kolkata, India.
89. Fifth International Workshop on "Variability Modeling of Software-intensive Systems" (VaMoS '11), January 27-29 2011 in Namur, Belgium.
90. 9th Workshop on Adaptive and Reflective Middleware (ARM 2010) November 27, 2010, Bangalore India, collocated with Middleware 2010.
91. The 22nd IASTED International Conference on Parallel and Distributed Computing and Systems (PDCS 2010), November 8-10, 2010, Marina Del Ray, California.
92. International Conference on Software Engineering, Management, and Application (ICSEMA 2010) Kathmandu, Nepal, October 29th and 30th, 2010.
93. The MobiCPS 2010 workshop, held in conjunction with the 7th International Conference on Ubiq- uitous Intelligence and Computing (UIC2010), October 26-29, 2010 Xian, China.
94. Fourteenth IEEE International Enterprise Computing Conference (EDOC 2010), 25-29 October 2010, Vitoria, ES, Brazil.
95. Advances in Business ICT (ABICT) 2010 Workshop Wisla, Poland, October 18-20, 2010.
96. 3rd Workshop on Model Based Architecting and Construction of Embedded Systems (ACES-MB), held in conjunction with MoDELS 2010, Oslo, Norway, October 3-8, 2010.
97. 4th Dynamic Software Product Line Workshop held in conjunction with the 14th International Software Product Line Conference 2010, Jeju Island, South Korea, September 13-17, 2010.
98. TOOLS Europe 2010, Malaga, Spain, June 28 to July 2, 2010.
99. 22nd International Conference on Software Engineering and Knowledge Engineering (SEKE'2010), to be held July 1-3, 2010, Redwood City, California.
100. 13th International Symposium on Component Based Software Engineering (CBSE 2010), June 23-25 2010 in Prague, Czech Republic.
101. Sixth European Conference on Modelling Foundations and Applications (ECMFA), University of Pierre & Marie Curie, Paris, France. June 15-18, 2010.
102. 10th IFIP WG 6.1 International Conference on Distributed Applications and Interoperable Systems (DAIS), Amsterdam, The Netherlands, June 7-9, 2010.
103. The 11th OMG Real-time/Embedded CORBA workshop, Washington DC, May 24-26, 2010.
104. Industrial track at the 32nd International Conference on Software Engineering (ICSE 2010), Cape Town (South Africa), May 2-8, 2010.

105. Thirteeth International Conference on Business Information Systems (BIS 2010), Berlin, Germany, May 3-5 2010.
106. 1st International Workshop on Product Line Approaches in Software Engineering, May 2nd, 2010, Cape Town, South Africa, held in conjunction with the 32nd International Conference on Software Engineering (ICSE 2010).
107. Workshop on Effective Multicasting for Future Critical Networked Systems (EMFINES 2010), at the Eighth European Dependable Computing Conference (EDCC), Valencia, Spain, April 28-30, 2010.
108. 1st Workshop on Model-Based Engineering for Embedded Systems Design, co-located with DATE 2010, March 12, 2010 in Dresden, Germany.
109. IEEE International Conference on Engineering of Complex Computer Systems (ICECCS 2010), Oxford 22-26, March 2010.
110. Special session on "Advanced Peer-to-Peer Protocols and Applications" at the Ninth IASTED International Conference on Parallel and Distributed Computing and Networks (PDCN 2010) February 16-18, 2010 Innsbruck, Austria.
111. Fourth Variability Modelling of Software-intensive Systems (VaMoS '10) workshop, Linz, Austria, January 27-29, 2010.
112. 8th Workshop on Adaptive and Reflective Middleware (ARM'09), in collocation with the 10th ACM/IFIP/USENIX Middleware Conference, in Urbana Champaign, Illinois, November 30th, 2009.
113. Workshop committee for OOPSLA 2009, Orlando Floria, October 25-29, 2009.
114. The ARTIST 2nd International Workshop on Model Based Architecting and Construction of Embedded Systems (ACESMB 2009), in conjunction with the 12th ACM/IEEE International Conference on Model Driven Engineering Languages and Systems (MODELS 2009), October 6th, 2009, Denver, Colorado.
115. The Thirteenth IEEE International EDOC Conference (EDOC 2009), 31 August - 4 September 2009, Auckland, New Zealand.
116. The 10th OMG Real-time/Embedded CORBA workshop, Washington DC, July 13–15, 2009.
117. The Software Engineering and Knowledge Engineering (SEKE'2009) conference, July 1-3, 2009, Boston, MA.
118. 12th International Symposium on Component-Based Software Engineering (CBSE 2009), East Stroudsburg University, Pennsylvania, USA, June 22-25, 2009.
119. The Second International Workshop on Cyber-Physical Systems (WCPS2009), held in conjunction with IEEE ICDCS 2009 in Montreal, Canada, June 22, 2009.
120. The Fifth European Conference on Model Driven Architecture Foundations and Applications (ECMDA), Gdansk, Poland, summer of 2009.
121. The 9th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS 2009) conference, Lisbon, Portugal, June 9-11, 2009.
122. The Fourth International Conference on COMmunication System softWAre and middlewaRE (COMSWARE), 15th - 19th June 2009, Trinity College Dublin, Ireland.
123. The UML&AADL Workshop, held in conjunction with ICECCS 2009 The fourteenth IEEE International Conference on Engineering of Complex Computer Systems June 02, 2009, Potsdam, Germany.
124. The 15th Real-time and Embedded Applications Symposium (RTAS) 2009, Track B, Real-time and Embedded Applications, Benchmarks and Tools, San Francisco, CA, United States, April 13 - 16, 2009.
125. Member of the ISORC 2009 advisory and publicity committee for ISORC 2009, March 17-20, 2009, Toyko, Japan.
126. the 13th International Software Product Line Conference (SPLC), August 24-28, 2009, San Francisco, CA.
127. the European Conference on Model Driven Architecture - Foundations and Applications 2009, University of Twente, Netherlands, June 2009.
128. The third workshop on "Variability Modelling of Software-intensive systems" (VaMoS'09), January 28-

30 2009 in Sevilla, Spain.

129. the 1st Workshop on Software Reuse Efforts, November 27-29, 2008 Brazil.
130. the 7th Workshop on Adaptive and Reflective Middleware (ARM'08) in collocation with the 9th ACM/IFIP/USENIX Middleware Conference, Leuven, Belgium, December 1st 2008.
131. the Middleware 2008 9th International Middleware Conference, December 1-6, 2008, Leuven, Belgium.
132. the 11th Component-Based Software Engineering conference, Karlsruhe, Germany, October 14-17, 2008.
133. the ARTIST International Workshop on Model Based Architecting and Construction of Embedded Systems (ACESMB 2008), in conjunction with the 11th ACM/IEEE International Conference on Model Driven Engineering Languages and Systems (MODELS 2008), Toulouse, September 29th, 2008.
134. the 6th Java Technology for Real-Time and Embedded Systems (JTRES) conference, Santa Clara, California, USA, 24-26 September, 2008.
135. the 12th IEEE International Enterprise Distributed Computing Conference (EDOC) (EDOC 2008), 15-19 September 2008, Munich, Germany.
136. the First Workshop on Analyses of Software Product Lines (ASPL'08), September 12, 2008 in Limerick, Ireland in conjunction with SPLC'08.
137. the 9th OMG Real-time/Embedded CORBA workshop, Washington DC, July 14–17, 2008
138. the 3rd International Conference on Software and Data Technologies, July 5-8, 2008, Porto, Portugal.
139. the 20th International Conference on Software Engineering and Knowledge Engineering (SEKE'08), Redwood City, California, USA, July 1-3, 2008.
140. the TOOLS EUROPE 2008 conference, June 30 to July 4, 2008 at ETH Zurich.
141. National Conference on Research & Development in Hardware & Systems (CSI-RDHS 2008), Computer Society of India Kolkata Chapter & CSI Division I (Hardware & Systems), June 20-21, 2008, Kolkata, India.
142. the First International Workshop on Cyber-Physical Systems, Beijing, China, June 17 - 20, 2008.
143. the ECMDA 2008 (Fourth European Conference on Model Driven Architecture Foundations and Applications) in Berlin, June 09 - 12, 2008.
144. the Distributed Applications and Interoperable Systems (DAIS), Oslo, Norway, June 4, 2008.
145. the 2nd International Workshop on Ultra-Large-Scale Software-Intensive Systems (ULSSIS 2008), May 10-11, 2008 Leipzig, Germany.
146. the Automotive Systems Track at the 30th International Conference on Software Engineering (ICSE), Leipzig, Germany, 10-18 May 2008.
147. the Real-Time and embedded Applications / Benchmarks track at the 14th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2008), St. Louis, MO, April 22-24, 2008.
148. the 3rd UML and AADL Workshop held in conjunction with the 13th IEEE International Conference on Engineering of Complex Computer Systems, Belfast, Northern Ireland, 31 March - 4 April 2008.
149. the ACM Programming for Separation of Concern track at SAC 2008, Fortaleza, Brazil, March 16-20, 2008.
150. the 6th edition of the International Workshop on Adaptive and Reflective Middleware, held in conjunction with Middleware 2007 in Newport Beach, California.
151. the IEEE/ACM/USENIX Middleware conference, November 2007.
152. the IASTED International Conference on Parallel and Distributed Computing and Systems, PDCS 2007, Cambridge, MA, USA from Nov 19-21, 2007.
153. the 9th International Symposium on Distributed Objects, Middleware, and Applications (DOA),

Iberian peninsula and islands, Oct 28 - Nov 2, 2007.

154. Member of the Doctoral Symposium committee at OOPSLA 2007, Portland, OR October 21-25, 2007.
155. the International Symposium on Ambient Intelligence and Computing, October 2007, Korea.
156. the IEEE conference on Enterprise Distributed Object Computing (EDOC), Annapolis, MD, October 15-19, 2007.
157. the 5th Java Technology for Real-Time and Embedded Systems (JTRES), Vienna, Austria, 26-28 September, 2007.
158. the Workshop on Trade-Off analysis of Software Quality Attributes (TOSQA), collocated with the sixth joint meeting of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering, Dubrovnik, Croatia, September 3-7, 2007.
159. the 2nd International Conference on Software and Data Technologies, July 22-25th 2007, Barcelona, Spain.
160. the Fourth IEEE International Conference on Web Services, Salt Lake City, UT, July 9-13, 2007.
161. the 10th International Component-Based Software Engineering (CBSE) Symposium, Boston, MA, July 9-11 2007.
162. the 8th OMG Real-time/Embedded CORBA workshop, Washington DC, July 9–12, 2007.
163. the International Conference TOOLS EUROPE 2007, Zurich, Switzerland on June, 24-28 2007.
164. the track on "Real-Time and Embedded Applications and Benchmarks" for the 13th IEEE Real- Time and Embedded Technology and Applications Symposium, Bellevue, WA, April 3 - April 6, 2007.
165. the Workshop on the Foundations of Interactive Computation (FInCo 2007), Braga, Portugal, March 24 - April 1, 2007.
166. the 15th International Workshop on Parallel and Distributed Real-Time Systems (WPDRTS), Long Beach, California, 26-27 March, 2007.
167. the ACM Symposium on Applied Computing, Programming for Separation of Concerns track, Seoul, Korea, March 11 - 15, 2007.
168. the Workshop on Pervasive Computing Environments and Services (PCES 07), Naples, Italy, Feb 7-9, 2007.
169. the Minitrack on Components for Embedded and Real-time Systems at the 40th Hawaiian International Conference on System Sciences, January 3-6, 2007 at Waikoloa, Big Island, Hawaii.
170. the 13th Asia Pacific Software Engineering Conference (APSEC06), Bangalore, India, Dec 6-8, 2006.
171. the Real-time Middleware and Software Engineering track of the The 27th IEEE Real-Time Systems Symposium, December 5-8, 2006 Rio de Janeiro, Brazil.
172. the 2nd International Conference on Trends in Enterprise Application Architecture, November 29th to December 1st, 2006, Berlin, Germany.
173. the workshop on MOdel Driven Development for Middleware (MODDM), November 27, 2006, Melbourne, Australia.
174. the International Symposium on Distributed Objects and Applications (DOA), Montpellier, France, Oct 29 - Nov 3, 2006.
175. the "Library-Centric Software Design" (LCSD'06) workshop at the OOPSLA'06 conference in Port- land, Oregon, October 22-26, 2006.
176. Judge for the Student Research Competition at OOPSLA 2006, Portland, OR, October 23-24, 2006.
177. the NSF Workshop On Cyber-Physical Systems, October 16 - 17, 2006, Austin, Texas.
178. the Models at Run-Time MaRT-06 workshop held at the MoDELS 2006 conference, Genova Italy, Oct. 2-6, 2006.
179. the MoDELS 2006 conference, Genova Italy, Oct. 2-6, 2006.
180. the 7th OMG Real-time/Embedded CORBA workshop, Washington DC, July 11–14, 2006.

181. the European Conference on Object-Oriented Programming, Nantes, France, July 3-7, 2006.
182. the 9th International Symposium on Component-Based Software Engineering (CBSE 2006), Mal- ardalen University, Sweden, June 29th-1st July 2006.
183. the 28th International Conference on Software Engineering (ICSE 28), May 24-26, 2006, Shanghai, China.
184. the 14th International Workshop on Parallel and Distributed Real-Time Systems, April 25-26, 2006, Island of Rhodes, Greece.
185. the 9th IEEE International Symposium on Object-oriented Real-time Distributed Computing, April 24-26, 2006, Gyeongju, Korea.
186. the Automotive Software Workshop San Diego (ASWSD 2006), University of California, San Diego, March 15-17, 2006.
187. the C++ Connections: 20 Years of C++ conference, Nov 7-11, 2005, Mandalay Bay, Las Vegas, NV.
188. the Conference on Distributed Objects and Applications (DOA 2005), Oct 31 - Nov 4, 2005, Agia Napa, Cyprus.
189. the 20th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOSPLA), October 16-20, 2005, San Diego, CA, USA.
190. the 6th International Conference on Middleware (Middleware'2005), October, 2005, Grenoble, France.
191. the 2005 Monterey Workshop on Networked Systems, Laguna Beach, California, September 22-24, 2005.
192. The 12th Pattern Language of Programs (PLoP 2005), September 7-10, 2005, Allerton Park, Monticello, Illinois, USA.
193. the 14th IEEE International Symposium on High-Performance Distributed Computing (HPDC-14), Research Triangle Park, North Carolina, July 27, 2005.
194. the 5th International Workshop on Software and Performance (WOSP 2005), Palma de Mallorca, Spain, July 11-15, 2005.
195. the 6th OMG Real-time/Embedded CORBA workshop, Washington DC, July 11–14, 2005.
196. the 5th IFIP WG 6.1 International Conference on Distributed Applications and Interoperable Systems (DAIS 2005), June 15-17, 2005, Athens, Greece.
197. the International Conference on Autonomic Computing (ICAC 2005), Seattle, WA, June 2005.
198. the International Symposium on Component-Based Software Engineering (CBSE), co-located with the International Conference on Software Engineering (ICSE), May 14-15, 2005, St. Louis, MO.
199. the Foundations of Interactive Computation (FINCO'05) Workshop, Saturday, 9 April 2005, in Edinburgh, Scotland.
200. the Embedded Applications track of the IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS) 2005, San Francisco, California, March 2005.
201. the "Programming for Separation of Concerns" track at Symposium on Applied Computing (SAC 2005), Santa Fe, New Mexico, March 2005.
202. the 12th International Symposium on the Foundations of Software Engineering, November 6th, 2004, Newport Beach, California.
203. the Conference on Distributed Objects and Applications (DOA 2004), October 25-29, 2004 in Cyprus, Greece.
204. the 2nd International Workshop on Java Technologies for Real-Time and Embedded Systems (JTRES), October 25-29, 2004, Larnaca, Cyprus.
205. the 3rd Workshop on Reflective and Adaptive Middleware (RM2004), October 19, 2004, Toronto, Ontario, Canada.
206. the Middleware 2004 5th IFIP/ACM/USENIX International Conference on Distributed Systems

Platforms, October 18-22, 2004, Toronto, Canada.

207. the 4th TAO+CIAO Workshop, Arlington, VA, July 16, 2004.
208. the DARPA Workshop on Java in Real-Time and Embedded Defense Applications, Arlington, VA, July 13, 2004.
209. the OMG Real-time/Embedded CORBA workshop, Crystal City, VA, July 12–15, 2004.
210. the ECOOP 2004 conference, June 14-18, 2004, Oslo, Norway.
211. the Middleware track of the 24th IEEE International Conference on Distributed Computing Systems (ICDCS), May 23-26, 2004, Tokyo, Japan.
212. the 2nd International Workshop on Remote Analysis and Measurement of Software Systems (RAMSS), Edinburgh, Scotland, UK, May 24, 2004.
213. Aspect-Oriented Software Development conference, Lancaster, England, March 22-26, 2004.
214. the SPIE/ACM Conference on Multimedia Computing and Networking, January 21-22, 2004 Santa Clara, California.
215. the Real-time Systems Symposium (RTSS), Cancun, Mexico, December 3-5, 2003.
216. the 4th IFIP International Conference on Distributed Applications and Interoperable Systems (DAIS), Paris - France November 17-21, 2003.
217. the International Workshop on Java Technologies for Real-Time and Embedded Systems (JTRES), November 3-7, 2003, Catania, Sicily, Italy.
218. the Domain Driven Development track at the OOPSLA 2003 18th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications, October 26-30, 2003, Anaheim, California, USA.
219. the OOPSLA 2003 18th Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications, October 26-30, 2003, Anaheim, California, USA.
220. External reviewer for the 2nd Generative Programming and Component Engineering (GPCE '03) conference, Erfurt, Germany, September 22-25, 2003.
221. the OMG Real-time/Embedded CORBA workshop, Crystal City, VA, July 14–17, 2003.
222. the The 2nd Workshop on Reflective and Adaptive Middleware, Rio de Janeiro, Brazil, June 17, 2003.
223. the ACM SIGPLAN 2003 Conference on Programming Language Design and Implementation (PLDI), San Diego, California, June 9 - 11, 2003.
224. the 1st International Workshop on Remote Analysis and Measurement of Software Systems (RAMSS), Portland, Oregon, May 9, 2003.
225. External reviewer for the 17th International Parallel and Distributed Processing Symposium, April 22–26, 2003, Nice, France.
226. the ACM International Conference on Aspect-Oriented Software Development, March 17 - 21, 2003, Boston, MA.
227. the SPIE/ACM Conference on Multimedia Computing and Networking, Santa Clara, California, January 29–31, 2003.
228. the International Workshop on Product Line Engineering The Early Steps: Planning, Modeling, and Managing (PLEES '02), Seattle, WA, November 5, 2002.
229. the 8th IEEE Real-Time and Embedded Technology and Application Symposium (RTAS), San Jose, CA, September 24-27, 2002.
230. the 9th Conference on Pattern Language of Programs, Allerton Park, IL, September 8-12, 2002.
231. the Workshop on Dependable Middleware-Based Systems, held as a part of DSN 2002, Washington, D.C., June 23-36, 2002.
232. the 2nd TAO Workshop, Arlington, VA, July 19, 2002.
233. the OMG Real-time/Embedded CORBA workshop, Crystal City, VA, July 15–18, 2002.

234. the 16th European Conference on Object-Oriented Programming, University of Malaga, Spain June 10-14, 2002.
235. the Tenth International Workshop on Quality of Service (IWQoS), May 15-17, 2002, Miami Beach, Florida.
236. the International Symposium on Object-Oriented Real-time Distributed Computing (ISORC), Washington DC, April 29 – May 1, 2002.
237. the Seventh IEEE International Workshop on Object-oriented Real-time Dependable Systems (WORDS 2002), January 7-9, 2002, San Diego, CA.
238. the International Workshop on Multimedia Middleware October 5th, 2001, Ottawa, Canada.
239. the OMG Workshop on Real-time and Embedded CORBA, in Reston, VA, June 4-6, 2001.
240. the USENIX 2001 conference, Boston, MA, June 25-30, 2001.
241. the International Symposium on Object-oriented Real-time Distributed Computing (ISORC), May 2-4, Magdenburg, Germany, 2001.
242. the 6th USENIX Conference on Object-Oriented Technologies and Systems, January 27 - February 3, 2001, San Antonio, TX.
243. External reviewer for OOPSLA 2000, Minneapolis, MN, October 2000.
244. the 3rd IFIP International Conference on Trends towards a Universal Service Market (USM'2000), September 12-14, 2000.
245. the International Symposium on Distributed Objects and Applications (DOA '00), OMG, Antwerp, Belgium, September 2000.
246. the ACM SIGCOMM 2000, Stockholm, Sweden, August 30 to September 1st, 2000.
247. the Pattern Languages of Programming (PLoP) conference, Monticello, Illinois, August, 2000.
248. the 9th IEEE International Conference on High-Performance Distributed Computing, August, 2000.
249. the "International Workshop on Software Engineering for Parallel and Distributed Systems" (PDSE 2000), at the 22nd International Conference on Software Engineering (ICSE-2000), in Limerick, Ireland in June, 2000.
250. the 6th IEEE Real-Time Technology and Application Symposium (RTAS), May 17-19, 2000, Washington DC, USA.
251. the 1999 ACM OOPSLA conference, Denver, Colorado, November 1-5, 1999.
252. the IFIP Sixth International Workshop on Protocols For High-Speed Networks (PfHSN '99), Wednesday August 25 – Friday August 27, 1999 Salem, MA.
253. the 1999 IEEE Real-Time Technology and Applications Symposium (RTAS99), Vancouver, British Columbia, Canada, June 2-4, 1999.
254. the 5th USENIX Conference on Object-Oriented Technologies and Systems, May 3-7, 1999, San Diego, CA.
255. Technical workshop committee for the International Software Architecture workshop, ACM SIGSOFT's FSE9 conference in Orlando FL, November 1-5, 1998.
256. the workshop on Software and Performance (WOSP98), Santa Fe, New Mexico, Oct 12-16 1998.
257. the IFIP International Conference on Distributed Systems Platforms and Open Distributed Processing: Middleware '98. September 15-18 1998, The Lake District, England.
258. the TOOLS USA'98 conference. Santa Barbara, California, August 3 - 7, 1998.
259. the IEEE High Performance Distributed Computing conference, Chicago, IL, July 28-31, 1998.
260. 12th European Conference on Object-Oriented Programming, Brussels, Belgium, July 20 - 24, 1998.
261. the 3rd EuroPLoP conference, Kloster Irsee, Germany, July 9-11, 1998.
262. the IEEE International Conference on Configurable Distributed Systems (ICCDS '98), Annapolis, MD, May 4-6, 1998.

263. the IEEE IWQoS '98 in Napa Valley, CA, May 18-20, 1998.
264. the 4th USENIX Conference on Object-Oriented Technologies and Systems, April 26-29, 1998, Santa Fe, New Mexico.
265. the 3rd International Workshop on Software Engineering for Parallel and Distributed Systems, at the 20th International Conference on Software Engineering (ICSE-20), in April 20-21, Kyoto, Japan.
266. the IEEE Conference on Open Architectures and Network Programming, April 3-4, 1998, San Francisco, CA.
267. the Workshop on Middleware for Real-Time Systems and Services, held in conjunction with IEEE Real-time Systems Symposium, December 2nd, San Francisco, California.
268. the Open Signaling for ATM, Internet and Mobile Networks. October 6th and 7th, 1997, Columbia University, New York, NY.
269. the 24th International Conference on Technology of Object-Oriented Languages and Systems (TOOLS Asia '97). Beijing, China, September 22 - 25, 1997.
270. the 4th Pattern Languages of Programming conference, Allerton Park, Illinois, September 3-5, 1997.
271. the 3rd USENIX Conference on Object-Oriented Technologies and Systems, Portland, June 16-19th 1997.
272. Session chair of the Patterns technical paper session at ECOOP '97, June 13th, 1997.
273. the 1997 European Conference on Object-Oriented Programming (ECOOP), June 9-13, 1997, Jyvskyl, Finland.
274. Chair of the technical session on "Distributed Object Computing" for the IFIP/IEEE Fifth International Workshop on Quality of Service (IWQoS '97).
275. the 2nd International Workshop on Software Engineering for Parallel and Distributed Systems, at the 19th International Conference on Software Engineering (ICSE-19) Sheraton Boston Hotel and Towers, Boston, Massachusetts, USA, May 19 and 20, 1997.
276. the 3rd USENIX Conference on Object-Oriented Technologies and Systems, Portland, 1997.
277. the 5th IEEE International Workshop on Object-Orientation in Operating Systems, IEEE TCOS and USENIX, Seattle, Washington, October 27-28, 1996.
278. the 1997 ACM SIGCOMM conference, Cannes, French Riviera, France, September 1997.
279. the 1997 IEEE INFOCOM conference, Kobe, Japan, April 1997.
280. the 1996 IEEE INFOCOM conference, San Francisco, CA, USA, March 24-28, 1996.
281. the 1995 IEEE INFOCOM conference, Boston, Massachusetts, USA, April, 1995.
282. the 3rd IEEE workshop on Architecture and Implementation of High-Speed Communication Subsystems (HPCS '95), held in Mystic, Connecticut, August 1995.
283. the 8th IFIP International Working Conference on Upper Layer Protocols, Architectures, and Applications, held in Barcelona, Spain, June 1 to 3, 1994.

Workshops and Panels Organized

1. Co-organized the Patterns for Generative AI in Software Engineering Activities workshop, April, 2026 collocated with XP 2006 in San Paolo, Brazil.
2. Co-organized the International Workshop on Envisioning the AI-Augmented Software Development Life Cycle (AI-SDLC), June 24, 2025 collocated with FSE 2025 in Trondheim, Norway.
3. Co-organized the 1st International Workshop on Data Dissemination for Large scale Complex Critical Infrastructures (DD4LCCI 2010), at the Eighth European Dependable Computing Conference, Valencia, Spain, April 28-30, 2010.
4. Co-organized the OOPSLA Jeopardy panel at OOPSLA 2009, Orlando Floria, October 25-29, 2009.
5. Co-organized a workshop entitled First International Workshop on Software Technologies for Ultra-Large-Scale (ULS) Systems at 29th Int. Conference on Software Engineering, May 20-29th, Min-

neapolis, MN, 2007.

6. Co-organized a session on architectures, platforms, and standards for QoS-enabled dissemination at the Systems and Information Interoperability Meeting, Oct 25-27, 2006 at the Minnowbrook Conference Center, Blue Mountain Lake, NY.
7. Co-organized a workshop entitled "Breathturn: Ultra Large-Scale Systems" at OOPSLA 2006, October 26, 2006, Portland, OR.
8. Co-chair of the NSF workshop on open-source Middleware for Distributed Real-time and Embedded Systems, 7th OMG Real-time/Embedded CORBA workshop, Arlington, VA, July 10–13, 2006.
9. Organized and led a session on architectures, platforms, and standards for real-time tactical information management at the Systems and Information Interoperability Meeting, Oct 18-21, 2005 at the Minnowbrook Conference Center, Blue Mountain Lake, NY.
10. Co-organizer of the technical workshops program at OOPSLA 2005, San Diego, October 16th-20, 2005.
11. Co-organizer for the MODELS 2005 workshop on "MDD for Software Product-lines: Fact or Fic- tion?", October 2, 2005, Jamaica.
12. Co-organizer of the OOPSLA '02 workshop on "Patterns in Distributed Real-Time and Embedded Systems", Seattle, WA, November, 2002.
13. Co-organizer of the OOPSLA '01 workshop on "Towards Patterns and Pattern Languages for OO Distributed Real-time and Embedded Systems" Tampa Bay, FL, October 14, 2001.
14. Organizer and chair of a panel on real-time extensions to OO middleware, OPENSIG Fall '97 workshop on Open Signaling for ATM, Internet and Mobile Networks Columbia University, October 6-7 1997, New York, NY.
15. Co-organizer of a workshop for the 1997 European Conference on Object-Oriented Programming entitled CORBA: Implementation, Use, and Evaluation, Jyvaskyla, Finland, June 10th, 1997.
16. Organizer and chair of a panel on "QoS and Distributed Systems Platforms" for the IFIP Fifth In-ternational Workshop on Quality of Service (IWQoS '97), May 22-24th, 1997, Columbia University, New York.
17. Co-organizer of the OOPSLA '95 workshop on "Patterns for Concurrent, Parallel, and Distributed OO Systems."
18. Co-facilitator of the ECOOP '95 workshop on Pattern Languages of Object-Oriented Programs, Aarhus, Denmark, August 1995.

Reviewer for Professional Submittals

Reviewed papers for the following journals, conferences, books, reports, and grant review processes:

1. The 32nd International PLoP 2025 conference on Pattern Languages of Programs, People & Practices.
2. The National Academy of Sciences report on *Defense Software for a Contested Future: Agility, Assurance, and Incentive*, May, 2025.
3. Reviewer for COVID-19 proposals to the C3.ai Digital Transformation Institute, June, 2020.
4. *The 21st IEEE International Symposium on Real-time Computing (ISORC)*, Nanyang Technological University, Singapore, 29th - 31st May 2018.
5. *Future Generation Computer Systems*, Elsevier, edited by Aniruddha Gokhale et al., 2016.
6. *IEEE Software*, Special Issue on Next Generation Mobile Computing, edited by James Edmondson et al., 2013.
7. *Software Testing in the Cloud*, edited by Scott Tilley, 2012.
8. Elsevier Information & Software Technology special issue on Software Reuse and Product Lines, 2012.
9. The 2010 Military Communications Conference, Cyber Security and Network Management, San Jose, CA, October 31-November 3, 2010.
10. *Model-Driven Domain Analysis and Software Development: Architectures and Functions*, edited by Janis Osis and Erika Asnina, 2010.

11. Reviewer for the book "Patterns for Parallel Software Design," by Jorge L. Ortega Arjona, Wiley, 2010.
12. Special Issue on Industrial Applications of Aspect Technology for the journal Transactions on Aspect-Oriented Software Development (TAOSD), 2009.
13. *Software Engineering for Self-Adaptive Systems*, edited by Betty H. C. Cheng, Rogerio de Lemos, Holger Giese, Paola Inverardi, and Jeff Magee, Springer, 2009.
14. Special issue on Service Oriented Computing for the ACM Transactions on the Web journal, 2008.
15. Special Issue in Software Reuse: Methods, Processes, Tools and Experiences for the Journal of the Brazilian Computer Society (JBCS), 2007
16. Designing Software-Intensive Systems: Methods and Principles book, 2008
17. Special issue on Patterns for the IEEE Software, 2007
18. IEEE Internet Computing Magazine, 2006.
19. IEEE Transactions on Parallel and Distributed Systems, 2004
20. International Journal of Software Process: Improvement and Practice Special issue - Software Variability: Process and Management
21. IEEE Internet Computing Magazine
22. 2004 NSF NSG panel
23. IEEE Transactions on Parallel and Distributed Computing special issue on Middleware, 2003
24. 2003 NSF ITR panel
25. 2002 NSF CAREER panel
26. IEEE Internet Computing Magazine, 2002
27. NIST Competence Proposals, May 2002
28. DARPA MoBIES program, May 2002
29. DARPA NEST program, May 2002
30. DARPA DASADA program, April 2002
31. Elsevier Journal of Systems and Software Special Issue on Software Architecture: Engineering Quality Attributes, 2002.
32. IEEE Communications Magazine, Evolving Communications Software: Techniques and Technologies, 2001
33. DARPA Network Embedded Software Technology (NEST) program, 2001
34. DARPA Software Enabled Control (SEC) program, 2000
35. IEEE Concurrency magazine, Object-Oriented Systems Track, 1999
36. IEEE Journal on Selected Areas in Communications special issue on "Service Enabling Platforms for Networked Multimedia Systems," 1999
37. IEEE Journal of Communications and Networks, 1999
38. Reviewer for the 4th Pattern Languages of Programming Design book published by Addison Wesley
39. The International Journal of Time-Critical Computing Systems, special issue on Real-time Middleware, edited by Wei Zhao
40. Next Generation Internet (NGR) networking research review panel, October 1998
41. IEE Transactions on Software Engineering, special issue on Configurable Distributed Systems
42. Theme issue on Symbolic Modeling in Practice for the Communications of the ACM
43. "Multimedia DBMS and the WWW" Minitrack at the 32nd Hawaii International Conference on System Sciences, 1999
44. "Dependable Distributed Systems" Minitrack at the 32nd Hawaii International Conference on Sys-

tem Sciences, 1999

45. IEEE Computer special issue on "Design Challenges for High-Performance Network Interfaces," 1998
46. 1998 NSF Experimental Software Systems review panel.
47. ACM SIGMetrics Conference, 1998
48. ACM Transactions on Software Engineering Methods
49. Special Issue on Patterns and Pattern Languages for the journal of Theory and Practice of Object Systems, (Stephen P. Berczuk, Editor), John Wiley and Sons, 1995
50. Special Issue of Computer Communications on Building Quality of Service into Distributed Systems
51. IEEE Communications Magazine
52. IEEE/ACM Journal of Transactions on Networking
53. Communications of the ACM
54. IEE/BCS Distributed Systems Engineering Journal
55. Software Practice and Experience, John Wiley and Sons
56. 1998, 1997, and 1996 NSF networking program
57. 1996 NSF software engineering and programming languages CAREER panel
58. 1994 California MICRO (Microelectronics Innovation Computer Research Opportunity) engineering computer network grant review process
59. IEEE Conference on Parallel and Distributed Computing Systems, 1994
60. IEEE International Conference on Computer Communications and Networks, 1994
61. IEEE INFOCOM conference, 1994
62. 1993 NASA Applied Information Systems Research grant review process
63. 1992 California MICRO (Microelectronics Innovation Computer Research Opportunity) engineering computer network grant review process
64. 7th *IFIP International Conference on Upper Layer Protocols, Architectures, and Applications*, 1992
65. The 1992 Special Issue on Measurement for IEEE Journal Transactions on Software Engineering.

Patents

1. US patent 7,523,471 – "Interpretive network daemon implemented by generic main object," in conjunction with Karlheinz Dorn, Dieter Quehl, Detlef Becker, and Christian Scharf of SIEMENS Medical Engineering, Erlangen, Germany, 2009.

Theses Supervised

- **Doctoral and Master's Committees Chaired**

1. Chaired the MS thesis committee for Brian Sharber, November 2023.
2. Chaired the master's committee for Chi-Cheng Chang, December 2022.
3. Chaired the master's thesis committee for Cici Wang, November 2021.
4. Chaired the master's thesis committee for Evan Segaul, March 2021.
5. Co-chair of the doctoral dissertation defense for Peng Zhang, August 2018.
6. Co-chair of the doctoral dissertation defense for James Edmondson, March 2012.
7. Co-chair of the doctoral topic defense for James Edmondson, December 2011.
8. Co-chair of the doctoral dissertation defense for Will Otte, November 2011.
9. Chair of the doctoral dissertation defense for Brian Dougherty, March 2011.
10. Chair of the doctoral topic defense for Brian Dougherty, June 2010.

11. Chair of the master's defense for Pooja Varshneya, May 2010.
12. Chair of the doctoral topic defense for Nilabja Roy, March 2010.
13. Chair of doctoral topic defense for Joe Hoffert, November 2009.
14. Chair of the doctoral dissertation defense for Jai Balasubramanian, September 2009.
15. Chair of master's defense for Friedhelm Wolf, March 2009.
16. Chair of the doctoral dissertation defense for Nishanth Shankaran, October 2008.
17. Chair of the doctoral dissertation defense for Jules White, October 2008.
18. Chair of doctoral dissertation defense for Gan Deng, December 2007.
19. Chair of doctoral dissertation defense for Krishnakumar Balasubramanian, September 2007.
20. Chair of the doctoral topic defense for Nishanth Shankaran, April 2007.
21. Chair of doctoral topic defense for Krishnakumar Balasubramanian, March 2006.
22. Chair of doctoral topic defense for Gan Deng, March 2006.
23. Chair of final doctoral dissertation defense for Arvind Krishna, December 2005.
24. Chair of master's thesis committee for Emre Turkay, summer 2005.
25. Chair of doctoral topic defense for Arvind Krishna, summer 2005.
26. Chair of master's thesis committee for Ossama Othman, December, 2002.
27. Chair of doctoral dissertation committee for Carlos O'Ryan, May, 2002.
28. Chair of dissertation topic defense committee for Carlos O'Ryan, September, 2001.
29. Chair of master's committee for Nagarajan Surendran, August, 1999.
30. Chair of master's committee for Alexander Babu Arulanthu, July, 1999.
31. Chair of oral exam committee for Chris Gill, June, 1999.
32. Chair of doctoral exam committee for Andy Gokhale, May, 1998.
33. Chair of master's exam committee for Sumedh Mungee, May, 1998.
34. Chair of master's exam committee for Sergio Flores, May, 1998.
35. Chair of master's committee for Prashant Jain, June 1997.
36. Chair of doctoral topic defense for James Hu, February 1997.
37. Chair of master's committee for Tim Harrison, February 1997.
38. Chair of doctoral topic defense for Andy Gokhale, October, 1996.

- **Doctoral and Master's Committees Member**

1. Served on the doctoral dissertation defense for Skyler Grandel, July 2026.
2. Served on the doctoral topic defense for Thea Henslee, April 2026.
3. Served on the doctoral dissertation defense for Ashraf Elhashar, March 2026.
4. Served on the doctoral topic defense for Skyler Grandel, February 2026.
5. Served on the doctoral topic defense for Ashraf Elhashar, November 2025.
6. Served on the doctoral dissertation defense for Carlos Olea, August 2025.
7. Served on the doctoral dissertation defense for Michael Sandborn, August 2024.
8. Served on the doctoral topic defense for Michael Sandborn, March 2024.
9. Served on the doctoral dissertation defense for Sam Hays, March 2024.
10. Served on the doctoral dissertation defense for Henry Gilbert, March 2024.
11. Served on the MS thesis committee for Lincoln Muir, March 2024.
12. Served on the doctoral topic defense for Henry Gilbert, January 2024.

13. Served on the doctoral topic defense for Sam Hays, October 2023.
14. Served on the doctoral dissertation defense for Quchen Fu, February 2023.
15. Served on the doctoral dissertation defense for Zhongwei Teng, November 2022.
16. Served on the doctoral topic defense for Quchen Fu, September 2022.
17. Served on the doctoral topic defense for Zhongwei Teng, April 2021.
18. Served on the master's thesis committee for Gabriela Gresenz, March 2021.
19. Served on the master's thesis committee for Xiaoxing Qiu, March 2021.
20. Served on the doctoral dissertation defense for Anirban Bhattacharjee, January 2020.
21. Served on the doctoral topic defense for Anirban Bhattacharjee, April 2019.
22. Served on the doctoral dissertation defense for Shunxing Bao, September 2018.
23. Served on the doctoral dissertation defense for Shashank Shekhar, May 2018.
24. Served on the doctoral dissertation defense for Fangzhou Sun, March 2018.
25. Served on the doctoral topic defense for Shunxing Bao, March 2018.
26. Served on the doctoral topic defense for Peng Zhang, January 2018.
27. Served on the doctoral dissertation defense for Marcelino Rodriguez-Cancio, December 2017.
28. Served on the doctoral dissertation defense for Yao Pan, November 2017.
29. Served on the doctoral topic defense for Fangzhou Sun, September 2017.
30. Served on the doctoral topic defense for Shashank Shekhar, May 2017.
31. Served on the doctoral topic defense for Yao Pan, February 2017.
32. Served on the doctoral dissertation defense for Faruk Caglar, July 2015
33. Served on the doctoral dissertation defense for Wei Yan, May 2015.
34. Served on the doctoral dissertation defense for Kyoungho An, March 2015.
35. Served on the master's thesis committee for Songtao Hei, March 2015.
36. Served on the master's thesis committee for Meng Wang, March 2015.
37. Served on the doctoral dissertation defense for Sean Hayes, January 2015.
38. Served on the doctoral dissertation defense for Hamilton Turner, November 2014.
39. Served on the doctoral topic defense for Faruk Caglar, November 2014.
40. Served on the doctoral topic defense for Hamilton Turner, February 2014.
41. Served on the doctoral dissertation defense for Fan Qui, February 2014.
42. Served on the doctoral dissertation defense for Xiaowei Li, May 2013.
43. Served on the doctoral topic defense for Fan Qiu, April 2013.
44. Served on the doctoral dissertation defense for Janos Mathe, August 2012.
45. Served on the doctoral dissertation defense for Tripti Saxena, July 2012.
46. Served on the doctoral dissertation defense for Akshay Dabholkar, April 2012.
47. Served on the doctoral topic defense for Xiawei Li, March 2012.
48. Served on the doctoral topic defense for Janos Mathe, August 2011.
49. Served on the doctoral dissertation defense for Liang Dai, April 2011.
50. Served on the doctoral dissertation defense for Daniel Balasubramanian, March 2011.
51. Served on the doctoral topic defense for Will Otte, February 2011.
52. Served on the doctoral topic defense for Akshay Dabholkar, February 2011.
53. Served on the doctoral dissertation defense for Joe Hoffert, February 2011.

54. Served on the doctoral topic defense for Tripti Saxena, January 2011.
55. Served on the doctoral dissertation defense for Nilabja Roy, November 2010
56. Served on the doctoral topic defense for Daniel Balasubramanian, October 2010.
57. Served on the doctoral dissertation defense for Sumant Tambe, September 2010.
58. Served on the doctoral topic defense for Sumant Tambe, April 2010.
59. Served on the doctoral dissertation defense for John Kinnebrew, March 2010.
60. Served on the doctoral dissertation defense for Shanshan Jiang, November 2009.
61. Served on the doctoral dissertation defense for James Hill, March 2009.
62. Served on the doctoral topic defense for James Hill, October 2008.
63. Served on the doctoral topic defense for Jai Balasubramanian, August 2008.
64. Served on the doctoral topic defense for Liang Dai, December 2008.
65. Served on the doctoral topic defense for Shanshan Jiang, November 2008.
66. Served on the doctoral topic defense for Jules White, April 2008.
67. Served on the doctoral topic defense for Amogh Kavimandan, February 2008.
68. Served on the doctoral dissertation defense for Amogh Kavimandan, November 2008.
69. Served on the doctoral topic defense for Amogh Kavimandan, February 2008.
70. Served on the doctoral dissertation defense for Michael Stal, University of Groningen, March 2007.
71. Served on the doctoral topic defense for Karlkim Suwanmongkol, fall 2004.
72. Served on the doctoral dissertation topic defense committee for Aditya Agrawal, July, 2004.
73. Served on the doctoral dissertation defense for Angelo Corsaro, July 2004.
74. Served on the doctoral dissertation defense for Nanbor Wang, April 2004.
75. Served on the doctoral topic defense for Angelo Corsaro, October 2003.
76. Served on the doctoral dissertation defense committee for Jonathan Sprinkle, July, 2003.
77. Served on the doctoral dissertation topic defense committee for Aditya Agrawal, June, 2003.
78. Served on master's committee for Kirk Kelsey, March 2003.
79. Served on the dissertation topic defense committee for Jonathan Sprinkle, February, 2003.
80. Served as external examiner for Bob Jolliffe's master's thesis Department of Computer Science, University of South Africa, March, 2003.
81. Served on the doctoral dissertation committee for Irfan Pyarali, December, 2001.
82. Served on the doctoral dissertation committee for Chris Gill, December, 2001.
83. Served as external examiner for Daniel Heggander's Ph.D. dissertation in the Department of Software Engineering and Computer Science at Blekinge Institute of Technology, Sweden, September, 2001.
84. Served as external examiner for Mohammad Radaideh's master's thesis in the Electrical En-gineering department at McMaster's University, Canada, Winter 2000.
85. Served as external examiner for David Holmes' Ph.D. dissertation in the information and computer sciences department at Macquarie University, Sydney, Fall 1999.
86. Served on final doctoral dissertation committee for Priya Narasimhan, August, 1999.
87. Served on the doctoral final dissertation defense for Christo Papadopoulos, August, 1999.
88. Served on dissertation topic defense for Michael Plezbert, February, 1999.
89. Served on master's committee for Craig Nauman, February, 1999.
90. Served on the doctoral exam committee for Chuck Cranor, July, 1998.

91. Served on master's exam committee for Mihai Tutunaru, April, 1998.
92. Served on the doctoral exam committee for Michael Plezbert, June, 1997.
93. Served on master's committee for Todd Rogers, June 1997.
94. Served on master's committee for Robert Engel, January 1997.
95. Served on committee for final doctoral dissertation defense of R. Gopalakrishnan, November, 1996.
96. Served on committee for final doctoral dissertation defense of Lorrie Cranor, September, 1996.
97. Served on the doctoral dissertation topic proposal committee for Christos Papadopoulos July, 1995.
98. Served on the doctoral dissertation topic proposal committee for Charles Cranor December, 1994.
99. Served on oral exam committee for Andy Gokhale December, 1994.
100. Served on the doctoral dissertation proposal committee for Lorrie Cranor, December, 1994.
101. Served on the doctoral final dissertation defense committee for Donald Wilcox, November, 1994.
102. Served on master's committee for Madhavapeddi Shreedhar, September, 1994
103. Served on the doctoral dissertation topic proposal committee for R. Gopalakrishnan, September, 1994.

- **Doctoral Student Advisees and Co-Advisees**

1. John Robert (USA)

- **Graduated PhD Students**

1. Jaiganesh Balasubramanian, Ph.D., 2009, Citigroup Managing Director, Global Head of Market Risk Technology, New York, NY.
2. Krishnakumar Balasubramanian, Ph.D., 2007, PayPal, California.
3. Angelo Corsaro, Ph.D., 2004, PrismTechnologies, Rome, Italy.
4. Akshay Dabholkar, Ph.D, 2012, Senior Principal Engineer, Alation
5. Gan Deng, Ph.D., 2007, Google, Seattle, WA.
6. Brian Dougherty, Ph.D., 2011, Optio Labs, Nashville, TN.
7. James Edmondson, Ph.D., 2012, Chief Technology Officer, Pebble Stone Coatings, Las Vegas, NV
8. Chris Gill, Ph.D. 2001, Professor, Washington University, St. Louis, MO.
9. Andy Gokhale, Ph.D. 1998, Professor, Vanderbilt University, Nashville, TN.
10. James Hill, Ph.D., 2009, Professor, Indiana University, Purdue University, Indianapolis.
11. Joe Hoffert, Ph.D. 2011, Associate Prof at Indiana Wesleyan Univ.
12. John Kinnebrew, Ph.D., 2010, mabl, Boston, MA.
13. Arvind Krishna, Ph.D. 2005, Qualcomm, Bengaluru, India.
14. William Otte, Ph.D, 2011, Software Engineer, Nevelex Corp
15. Irfan Pyarali, Ph.D. 2001, CitiGroup, New Jersey.
16. Nilabja Roy, Ph.D. 2010, Senior Software Engineer, Bloomberg, NY, NY.
17. Carlos O'Ryan, Ph.D., 2002, Google, NY, NY.
18. Nishanth Shankaran, Ph.D., 2008, LinkedIn, Seattle, WA.
19. Nanbor Wang, Ph.D. 2004, Research Scientist, Tech-X, Boulder, Colorado.
20. Sumant Tambe, Ph.D, 2010, Staff Software Engineer, LinkedIn

21. Jules White, Ph.D., 2008, Professor, Vanderbilt University, Nashville, TN.
22. Dana Zhang, Ph.D., 2018, Associate Professor of the Practice, Vanderbilt University, Nashville, TN.

- **Graduated Master's and Ugrad Students**

1. Alexander Babu Arulanthu, MS 1999, Sylantro, Campbell, CA.
2. Everett Anderson, BS 1998, Sun, Mountain View, CA.
3. Shawn Atkins, BS 1998, Lucent, Columbus, OH.
4. Matt Braun, BS 1998.
5. Darrell Brunsch, BS 1999, Microsoft, Redmond, WA.
6. George Edwards, BS 2004, Ph.D. student at University of Southern California.
7. Sergio Flores-Gaitan, MS 1998, Microsoft, Redmond, WA.
8. Priyanka Gontla, MS 2000, UBS, Irvine, CA.
9. Pradeep Gore, MS 2000, OOMWorks, New Jersey.
10. Tim Harrison, MS 1997, Mayasoft, Palo Alto, CA.
11. Prashant Jain, MS 1997, IBM Research, India.
12. Vishal Kachroo, MS 1999, Stentorsoft, CA.
13. Michael Kircher, BS 1998, Siemens CT, Munich, Germany.
14. Yamuna Krishnamurthy, MS 2000, OOMWorks, New Jersey.
15. Tao Lu, MS 2003, Trading Technologies, Chicago, IL.
16. Sumedh Mungee, MS 1998, Fujitsu, Santa Clara, CA.
17. Bala Natarajan, MS 2000, Veritas, India.
18. Kirthika Parameswaran, MS 2000, Telcordia, Piscataway, NJ.
19. Stoyan Paunov, MS 2006, working at Bloomberg, NYC.
20. Ossama Othman, MS 2002, independent consultant, Portland, OR.
21. Marina Spivak, MS 2000, AT Desk, Charleston, SC.
22. Nagarajan Surendran, MS 1999, Sylantro, Campbell, CA.
23. Emre Turkay, MS 2005, Turkey.
24. Pooja Varshneya, May 2010, Zircon Computing, Wayne, NJ.
25. Seth Widoff, BS 1998, independent consultant, San Francisco, CA.
26. Ming Xiong, MS 2007, currently working at AT Desk, Charleston, SC.

- **Former Staff**

1. Chris Cleeland, OCI, St. Louis, MO.
2. Ray Klefstad, Research Assistant Professor, University of California, Irvine.
3. Boris Kolpackov, Independent Consultant, South Africa.
4. Fred Kuhns, Research Associate, Washington University, St. Louis, MO.
5. David Levine, Director of Engineering, CombineNet, Inc, Pittsburgh, PA.
6. Will Otte, Institute for Software Integrated Systems, Nashville, TN
7. Jeff Parsons, Optio Labs, Nashville, TN
8. Jules White, Ph.D. 2008, Vanderbilt University, Nashville, TN

Research Support

Total research funding since June 1995: $42,158,523

- Sole PI: $12,177,796
- Co-PI: $29,980,727

Grants and Contracts Received

1. "Children Eating Well (CHEW) Smartphone Application for WIC Families," USDA 4/15/2017 to 4/14/2024, $962,421.84, co-PI with Pam Hull.
2. NSF, STTR Phase I: Digital Mental Health for Children and Adolescents, $76,788.93, 8/15/22-2/15/23.
3. "Cloud-based IoT Acceptance Test Methodologies for Air Force," AFRL, $35,000, 2/1/23-8/1/23, with Jules White.
4. "Love in a Big World-Digital Mental and Behavior Health for Children and Adolescents", NSF $147,393, 4/1/22-2/28/23.
5. "Automated Clothing Simulation and Human Avatar Generation Engine," NSF, 9/15/2019 to 2/29/2020, $50,000.
6. "Digital Thread Modeling Environment (DTME)," AFRL (subcontract through Securboration), 8/20/2019 to 8/20/2021, $250,000, with Jules White.
7. "Creating an Evidence-based Professional Development Support Tool for Pre-K Coaches and Teachers," Department of Education (IES), $1,399,992, 7/1/18 to 6/30/22, Co-PI with Caroline Christopher.
8. "Blockchain as Middleware Services for Transactive Energy Applications," Siemens, 4/1/2017 to 9/30/2018, $274,397, co-PI Abhishek Dubey.
9. "Industrial Internet Architecture," Varian Medical Systems, Inc., 10/1/14 to 12/31/18, $288,808, co-PI Jules White.
10. "Virtualize Combat System Environment, Securboration (ViCE)," $15,000, 1/1/18-3/26/18, Co-PI with Jules White.
11. "Container Hopping at Random Intervals or Targeted-Attacked (CHARIOT)," OSD SBIR with Securboration, 1/19/17 to 1/19/18, $35,000.
12. "A Digital Platform for Social and Emotional Learning," NSF, 7/1/2018 to 12/31/2018, $50,000.
13. "Blockchains Data Exchange via FHIR," Solaster, 9/1/18 to 8/31/19, $30,000, co-PI with Jules White.
14. "Advancing Data-Driven mHealth Technologies for Long-term Health and Health Behavior Change," Trans-Institutional Program (TIPs), Vanderbilt University, 9/1/2016 to 8/31/2018, $100,000, Co-PIs Jules White, Trent Rosenbloom, and Heidi Silver.
15. "IMMoRTALS," DARPA (through subcontract with BBN Technologies and Raytheon), 12/1/15 to 12/1/19, $1,235,567, Co-PI Jules White.
16. "The Robust Software Modeling Tool (RSMT)," ONR, 7/1/14 to 6/30/17, $749,904, Co-PI Jules White.
17. "Building Resilient Distributed Systems for Next Generation Mobile Adhoc Cyber Physical Systems," Siemens 9/1/14 to 8/31/17, $438,188, co-PI Abhishek Dubey.
18. "Capability-Based Technical Reference Frameworks for Open System Architecture Implementations," OSD ASDR&E, 7/3/14 to 9/11/14, $29,690.
19. "Progressive Model Generation for Adaptive Resilient System Software," ONR STTR, 8/6/13 to 1/31/14, $49,406, co-PI Jules White.
20. "Systems and Software PRodUcibility Collaboration and Experimentation Environment (S2PRUCE2)," AFRL (subcontract through Lockheed Martin Advanced Technology Lab), 1/4/13 to 9/30/13, $108,645, with A. Gokhale.
21. "Stochastic Hybrid Systems Modeling and Middleware-enabled DDDAS for Next-generation US Air Force Systems," AFOSR, 10/1/13 to 9/30/16, $935,402, Co-PI(s) Aniruddha Gokhale and Xenofon Koutsoukous.
22. "Workshop on Computing Clouds for Cyber Physical Systems," NSF, 9/15/12 to 12/31/2013,

$73,738.

23. "Using Social Learning to Improve Adolescent Diabetes Protocol Adherence," NIH, $1,798,029, 9/1/12-8/31/16, PI Shelagh Mulvaney.
24. "Systems and Software PRodUcibility Collaboration and Experimentation Environment (S2PRUCE2)," AFRL (subcontract through Lockheed Martin Advanced Technology Lab), 4/3/08 to 9/30/12, $381,708, with A. Gokhale.
25. "Team for Research in Ubiquitous Secure Technology (TRUST)," NSF (subcontract through UC Berkeley), 6/1/05 to 10/31/15, $5,970,900, co-PI(s) J. Sztipanovits and G. Karsai.
26. "Android Mobile Military Middleware Objects (AMMO)," DARPA, 9/30/10 to 5/02/12, $1,074,093, with S. Neema.
27. "Cyber-physical multi-Core Optimization for Resource and cachE effectS (C2ORES)", AFRL, 8/1/12 to 7/31/13, $300,000, with A. Gokhale.
28. "Model-Driven Tools for Distributed- and Multi-Core Middleware," AFRL, 4/10/12 to 10/2/12, $30,000, with A. Gokhale.
29. "Cloud Environmental Analysis and Relief," NSF, 8/1/10 to 7/31/12, $66,000, with A. Gokhale.
30. "Environment-Specific Inter-ORB Protocols," SAIC, 8/1/09 to 5/23/12, $348,350, with A. Gokhale.
31. "CoSMIC and CIAO Enhancements," Northrop Grumman, 7/1/09 to 9/30/10, $878,661
32. "Integrating DDS and CCM," Northrop Grumman, 7/1/09 to 2/15/10, $85,000
33. "Early Integration and Performance Testing of Heterogeneous Computing Environments," Australian Defence Science and Technology Organization (DSTO), 1/9/09 to 7/30/09, $180,000.
34. "Predictive Cache Modeling and Analysis," AFRL (subcontract through Lockheed Martin Aeronautics), 3/1/10 to 9/30/11, $100,000.
35. "Applications of Reliable, Fast Event Notification," Raytheon, 6/1/2008 to 5/30/2009, $60,000.
36. "Open Modular Embedded Architectures," General Electric Global Research, 8/1/2008 to 1/31/2009, $35,000.
37. "Analysis and Simulation Techniques for Next-generation Motion Control Systems," Aagard, 8/1/2008 to 1/31/2009, $13,850 with Akos Ledeczi.
38. "Open Modular Embedded Architectures," Raytheon, 8/1/2008 to 3/31/2009, $74,276.
39. "NAOMI," LMCO Advanced Technology Lab, 9/1/2007 to 11/30/2009, $290,000.
40. "IU/CRC Membership," Siemens, 1/1/2009 to 12/31/2009, $40,000.
41. "Enterprise Application Configuration in the Context of Model Driven Software Development and Software Factories," Siemens Corporate Research, 10/1/07 to 9/31/08 $91,798.
42. "Modular Extendable Demonstration of an Upgradeable Space Architecture (MEDUSA)," DARPA (subcontract through Lockheed Martin Advanced Technology Center), 2/1/2008 to 1/31/2011,

    $600,000.
43. "CCM Middleware Implementation and Integration," PrismTech, 6/8/2007 to 3/31/2007, $33,778.
44. "The Smart Sensor Web Architecture," NASA (subcontract through Lockheed Martin Advanced Technology Center), 12/15/06 to 11/14/09, $467,728, co-PI G. Biswas.
45. "I/UCRC Membership," General motors, 1/1/2008 to 12/31/2008, $100,000, co-PI G. Karsai.
46. "Pollux: Enhancing the Real-time QoS of the Global Information Grid," AFRL, 2/24/06 to 7/24/08, $1,242,718, co-PI M. Reiter.
47. "Intelligent Middleware for Next Generation Petascale Scientific Computing," Vanderbilt Discover Grant, 5/1/05 to 6/30/07, $100,000, co-PI(s) A. Gokhale and P. Sheldon.
48. "Air Force Center for Research on GIG/NCES Challenges," AFOSR (subcontract through UC Berkeley), 3/1/06 to 2/28/08, $600,000, co-PI J. Sztipanovits.

49. "Quality of Service Enabled Dissemination," AFRL (subcontract through BBN Technologies), 12/31/2007 to 9/30/2009, $320,000.
50. "A Fault-Tolerant Real-Time CORBA Naming Service," US Navy (subcontract through Tech-X Corp), 11/1/2007 to 4/30/2010, $175,000, co-PI A. Gokhale.
51. "System Execution Modeling Technologies for Large-scale Net-centric Systems," AFRL, 1/1/2008 to 12/31/2010, $244,000.
52. "Model-Driven Computing for Distributed Real-time Embedded Systems," Raytheon, 8/31/04 to 8/31/08, $500,000.
53. "NAOMI," LMCO Advanced Technology Lab, 9/1/2007 to 11/30/2007, $50,000.
54. "ACE/TAO Improvement Techniques and Solutions, Veritas/Symantec, 3/31/05 to 4/31/08, $198,500.
55. "Adaptive Resource Control for Certifiable Systems," DARPA (subcontract through LMCO Advanced Technology Lab), 3/30/2007 to 12/31/2007, $50,000.
56. "Survivable Internet-scale Distributed Systems," IDA, 3/30/2007 to 12/31/2007, $60,000.
57. "QUality of service pICKER (QUICKER)," LMCO Advanced Technology Lab, 3/30/2007 to 12/31/2007, $60,000.
58. "Thimble," LMCO Advanced Technology Lab, 3/30/2007 to 12/31/2007, $60,000.
59. "CADynCE Experimentation Operations (CEO)," DARPA (subcontract through LMCO Advanced Technology Lab), 8/31/2007 to 12/31/2007, $25,000.
60. "Real-time Discovery for Pub/Sub Middleware in WANs," US Navy (subcontract through Tech-X Corp), 6/16/2007 to 9/31/2007, $15,000.
61. "GEMS Utilization Test Suite," LMCO Advanced Technology Lab, 9/1/07 to 11/30/07, $50,000.
62. "Advanced Information Systems and Technology Program," NASA (subcontract through LMCO Advanced Technology Center), 11/13/2007 to 12/1/2007, $22,000, co-PI G. Biswas.
63. "Design for Adaptivity and Reliable Operation of Software Intensive Systems," NSF CNS-0613971, 9/1/06 to 8/31/08, $199,867, co-PI(s) S. Abdelwahed and G. Karsai.
64. "Software Technologies Targeting Interoperability for Systems of Systems," Army Research Lab, 1/15/07 1/14/10, $851,567, co-PI(s) G. Karsai and J. Sztpanovits.
65. "Software Wind Tunnel (SWiT) Capabilities," Lockheed Martin Advanced Technology Lab, 8/1/06 to 12/31/06, $60,000.
66. "High-Confidence Software Platforms for Cyber-Physical Systems," NSF, 5/1/06 to 7/30/08, $129,179.
67. "Applying AOP to Develop of Component Synthesis with MDD," Siemens, 3/1/03 to 2/28/07, $400,005.
68. "Addressing Domain Evolution Challenges in Model-Driven Software Product-lines," Siemens Corporate Research, 10/1/05 9/31/07, $100,000.
69. "A Fault Tolerant Real-time CORBA Naming Service," US Navy (subcontract through Tech-X Corp), 11/1/05 to 8/31/06, $15,000.
70. "The SYstem DEployment and Configuration AssisteR (SYDECAR)," Lockheed Martin Advanced Technology Lab, 8/1/05 to 8/1/08, $500,000.
71. "Future Combat Systems: Software Architecture Engineering," DARPA (subcontract through Boeing), 1/28/05 to 12/31/07, $2,764,226, co-PI(s) J. Sztipanovits and G. Karsai.
72. "Development of an Eclipse Plug-in," PrismTech, 4/28/05 to 9/30/05, $25,000.
73. "Prometheus: Enhancing the QoS of the JBI," AFRL, 3/25/05 to 12/31/05, $500,000, co-PI(s) K. Birman and Mike Reiter.
74. "A Testbed for Assuring Quality of Software for DRE Systems," ONR, 2/15/05 to 1/31/06, $200,000, co-PI(s) A. Gokhale and A. Porter.
75. "Enhancing the QoS of SOAs Using Eclipse-based MDD," IBM, 2/15/05 to 1/31/06, $29,515, co-PI A. Gokhale.

76. "Model-Driven Development of BEEP Application Protocols," Cisco, 12/15/04 to 12/14/05, $57,976, co-PI A. Gokhale.
77. "Evaluating CORBA Middleware for Space Systems," NASA (subcontract through Lockheed Mar- tin Advanced Technology Center), 9/23/04 to 11/30/06, $186,180, co-PI G. Biswas.
78. "Refactoring Techniques to Reduce Middleware Resource Utilization," Qualcomm, 10/31/04 to 10/31/05, $104,000, co-P B. Natarajan.
79. "Model-Driven Development for Software Defined Radios," BAE Systems, 12/1/04 to 3/31/05, $32,000.
80. "Enhancing the Robustness and Performance of TENA," DISA (subcontract through SAIC and OSC), 7/1/04 to 12/31/04, $75,000.
81. "QoS-enabled Fault Tolerant Middleware and MDA Tools," Lockheed Martin MSS, 4/1/03 to 12/31/04, $516,434.
82. "Trustworthiness in Embedded Systems," NSF ITR CCR-032574, 9/31/03 to 8/31/06, $210,454.
83. "ACE+TAO Enhancements," OCI, gift $20,000.
84. "Acquiring Accurate Dynamic Field Data Using Lightweight Instrumentation," NSF ITR CCR-0312859, 10/1/02 to 9/31/07, $1,850,000, co-PI(s) A. Porter, D. Notkin, and A. Karr.
85. "Intergovernmental Personnel Act," DARPA, 6/1/00 to 5/31/02, $198,934.
86. "Optimizing Component Models," DARPA, 4/1/01 to 6/31/02, $210,000.
87. "HLA RTI Next-generation," DMSO (subcontract through SAIC), 6/1/01 to 12/31/01, $70,895.
88. "ACE Enhancements for Windows NT and Windows CE," Siemens Medical Engineering, 2/1/00 9/19/01, $112,000.
89. "Scalable and Fault Tolerant Middleware," AFRL MURI, 12/1/99 to 3/31/02, $253,701.
90. "Protocol Engineering Research Center," AFOSR MURI, 6/15/00 to 6/14/03, $264,720, co-PI Tatsuya Suda.
91. "Optimizing ORBs for Network Management," Cisco Systems, 1/1/00 to 12/31/00, $100,000.
92. "TAO Optimizations," Raytheon, 10/1/99 to 6/01/01, $50,000.
93. "ACE+TAO on pSoS," Motorola, 8/15/99 to 12/31/99, $30,000.
94. "Real-time Distributed Object Computing," Sprint, 8/15/99 8/14/00, $133,068.
95. "TAO Enhancements," Krones, 8/1/99 to 9/1/99, $5,000.
96. "ACE Enhancements," ICOMVERSE, gift, $20,000.
97. "Weapon Systems Open Architecture," Boeing, 7/15/99 to 1/31/00, $51,491.
98. "Fault Tolerant CORBA," Motorola Labs, 7/15/99 to 7/14/00, $139,000.
99. "TAO Enhancements," Global MAINTECH, 7/1/99 to 8/1/99, $5,000.
100. "ACE QoS Extensions," Motorola Trunking, 6/1/99 to 8/1/99, $5,000.
101. "CORBA Interceptors," Experian, 5/15/99 7/14/99, $10,000.
102. "DCOM performance evaluation," Microsoft, gift, $30,000.
103. "TAO Improvements," OCI, 4/1/99 to 9/31/00, $27,000.
104. "Middleware Optimizations," Telcordia, 2/1/99 to 1/31/00, $52,700.
105. "Minimum CORBA," Hughes Data Networking, 4/1/99 to 3/31/00, $50,000, co-PI David Levine.
106. "Framework Usage Patterns," Siemens Corporate Research, 4/1/99 to 3/31/00, $35,000.
107. "Dynamic Scheduling and Real-time ORB Optimizations," Boeing, 10/1/98 9/30/99, $184,860.
108. "Distributed Object Computing Middleware," Nortel, 11/1/98 10/31/99, $75,000.
109. "ACE subsetting," Nokia, 10/8/98 4/8/99, $30,000.
110. "Boeing Research Fellowship," Boeing, 9/1/98 8/31/00, $81,486.

111. "Patterns and Frameworks Reuse Curriculum," Lucent Bell Labs, 9/1/98 12/31/98, $31,200.
112. "Patterns, Frameworks, and Components," Siemens ZT, 12/1/98 5/31/00, $175,000.
113. "High availability frameworks," Lucent, 9/1/98 8/31/99, $39,400.
114. "Real-time Distributed Object Computing," Sprint, 8/1/98 7/31/99, $288,194.
115. "Distributed Object Integration for the Quorum Project," DARPA S30602-98-C-0187 (subcontract through BBN), 9/1/98 8/31/01, $448,643, co-PI(s) R. Schantz and J. Loyall.
116. "Evaluating a Framework for Dynamic Distributed Real-Time Scheduling," USENIX, gift, $18,000.
117. "Distributed Object Computing," Microsoft, gift, $20,000.
118. "Distributed Object Visualization Environment," Lockheed Martin, 5/1/98 to 11/31/99, $54,000.
119. "Distributed Object Computing with Adaptive End-to-end QoS Guarantees," DARPA 9701561, 8/1/97 to 7/31/00, $873,625.
120. "Real-time CORBA for Telecommunications," Lucent, 12/1/97 to 11/31/98, $100,000.
121. "Developing an HLA-compliant RTI with ACE," SAIC, 12/15/97 to 1/31/00, $228,075.
122. "Real-time CORBA for Wireless," Motorola LMPS, 10/15/97 to 10/14/98, $200,000.
123. "Real-time CORBA for Avionics," Computing Devices International, 10/15/97 to 10/14/98, $39,050.
124. "Dynamic Scheduling of Real-time OFPs," Boeing, 9/1/97 to 8/31/98, $224,604.
125. "Distributed Object Visualization," Siemens MED, 10/1/97 to 9/1/98, $40,000.
126. "The ADAPTIVE Communication Environment," Siemens MED, 10/1/97 to 9/1/98, $70,000.
127. "The Architect's Assistant," Siemens Corporate Research, 9/1/97 to 8/1/98, $35,000.
128. "Monitoring, Visualization, and Control of High-Speed Networks," NSF NCR-97-14698, 9/1/97 to 8/31/01, $1,200,000, co-PI(s) G. Parulkar, E. Kraemer, J. Turner, and R. Cytron .
129. "Adaptive Software Technology Demonstration (ASTD)," AFRL (subcontract through Boeing), 9/1/98 to 8/31/02, $1,200,000, co-PI(s) B. Doerr, D. Allen, and R. Jha.
130. "Patterns, Frameworks, and Components for Multimedia Systems," Siemens Research, 1/97 to 6/98, $150,000.
131. "Adaptive Servers for High-Performance Imaging," Kodak Networked Imaging Tech. Center, 11/96 to 11/97, $40,000.
132. "Real-time CORBA," Sprint, 9/96 to 12/97, $345,000, co-PI G. Parulkar.
133. "OpenMAP – Object-Oriented Components for Real-time Avionics," McDonnell Douglas, 9/96 to 9/97, $241,591.
134. "Compilation and Automatic Optimization of Network Protocol Implementations," NSF NCR-9628218, 8/96 to 8/99, $411,025, co-PI(s) G. Varghese and R. Cytron (PI).
135. "Medical Imaging with Java and the WWW," SIEMENS Medical Engineering, 8/96 to 7/97, $125,000.
136. "The ADAPTIVE Communication Environment," SIEMENS Medical Engineering, 8/96 to 7/97, $90,000.
137. "High-performance Distributed Medical Imaging," Kodak Imaging, 12/94 to 8/96, $55,152, co-PI J. Blaine.
138. "Design Patterns for Concurrent Object-Oriented Networking," Object Technologies International, 4/96 to 4/97, $25,000.
139. "Distributed Object Computing with CORBA and DCE," Bellcore, 5/96 to 12/96, $32,978.
140. "The ADAPTIVE Communication Environment," SIEMENS Medical Engineering, 6/95 to 6/96, $170,000.

Courses Taught

Courses at Vanderbilt University

1. CS 215 – Intermediate Software Design, Spring 2006
2. CS 251 – Intermediate Software Design, Spring 2007, Spring 2008, Spring 2009, Fall 2009, Spring 2010, Spring 2012, Spring 2013, Spring 2014, Spring 2015, Spring 2016, Summer 2020, Summer 2021, Summer 2022, Summer 2023
3. CS 253 – Parallel Functional Programming with Java and Android, Fall 2020, Fall 2021, Fall 2022, Fall 2023
4. CS 254 – Concurrent Object-Oriented Programming with Java and Android Spring 2021, Spring 2022, Summer 2023
5. CS 291/242 – Software Design Studio, Fall 2004
6. CS 291/242 – Software Design Studio, Fall 2003
7. CS 292 – Beyond the Oneway Web, Fall 2008
8. CS 278 – Software Engineering, Fall 2008
9. CS 279 – Software Engineering Projects, Spring 2010
10. CS 282 – Principles of Operating Systems II, Spring 2003, Spring 2004, Fall 2005, Fall 2007, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Spring 2017
11. UNIV 278 – Tackling Big Questions with Mobile Cloud Computing, Fall 2016, Spring 2017, Fall 2017
12. CS 395 – Advanced Network Software Design, Fall 2006
13. CS 395 – QoS-enabled Middleware, Fall 2008
14. CS 8395 – Scalable Microservices, Summer 2021, Summer 2022, Spring 2023, Spring 2024
15. DS 3891 – Special Topics in Data Science - Intro to Generative Artificial Intelligence, Fall 2023, Spring 2024
16. CS 396 – QoS-enabled Component Middleware, Spring 2005
17. CS 891 – Introduction to Concurrent and Parallel Java Programming with Android, Fall 2017
18. CS 891 – Advanced Concurrent Java Programming in Android, Spring 2018, Spring 2019, Spring 2020
19. CS 891 – Introduction to Parallel Java Programming, Fall 2018, Fall 2019
20. CS 891 – Scalable Microservices, Spring 2023, Spring 2024
21. CS 892 – Concurrent Java Programming in Android, Spring 2017

Courses at Coursera

1. Android App Development (Android for Java; Android App Components - Intents, Activities, and Broadcast Receivers; Android App Components - Services, Local IPC, and Content Providers), 2016 to present
2. Mobile Cloud Computing with Android (Pattern-Oriented Software Architecture: Communi- cation; Pattern-Oriented Software Architecture: Concurrency), 2014 to 2016
3. Pattern-Oriented Software Architectures for Concurrent and Networked Software, 2013

Courses at University of California, Irvine

1. ECE 011 – Computational Methods in ECE, Winter 2000
2. ECE 255 – Distributed Software Architecture Design, Spring 2000
3. ICS 142 – Compiler Theory, Summer 1989
4. ICS 23 – Data Structures, Summer 1988

Courses at Washington University, St. Louis

1. CS 562 – Advanced Object-Oriented Software Development with Patterns and Frameworks,

Spring 1999

2. CS 242 – Introduction to Software Design, Spring 1998
3. CS 673 – Distributed Systems research seminar, Fall 1997
4. CS 422 – Operating Systems Organization, Fall 1997
5. CS 242 – Introduction to Software Design, Spring 1997
6. CS 544 – Distributed System Design, Fall 1996
7. Ada tasking course for McDonnell Douglas, Fall 1996
8. OO design course for McDonnell Douglas, Spring 1996
9. CS 523 – Distributed Operating Systems Organization, Spring 1995
10. CS 242 – Introduction to Software Design, Fall 1995
11. CS 673 – Distributed Systems research seminar, Spring 1995
12. CS 422 – Operating Systems Organization, Fall 1994

Other Teaching Experience

In addition to the academic teaching experience above, I have also taught numerous short-courses and tutorials on object-oriented design patterns and programming techniques, UNIX and Windows NT systems programming and network programming, C++ and C programming languages, and various distributed/networked system, compiler construction, algorithm, data structure, mobile app, and web-based cloud computing courses for the following universities and professional organizations:

- O'Reilly Live-Training
- Pearson LiveLessons
- University Extension Program, University of California, Berkeley, CA
- University Extension Program, University of California, Irvine, CA
- University Extension Program, University of California, Los Angeles, CA
- Oregon Graduate Institute of Science and Technology, Beaverton, OR
- USENIX association
- Association of Computing Machinery (ACM)
- Addison-Wesley's Technology Exchange Program, Reading, MA
- SIGS Conferences
- Object Computing Institute, St. Louis, MO
- National University, Irvine, CA

Department/School/Community Service

Service at William & Mary

1. Member of the AI Innovation and Policy Council
2. Member of the AI Policy Initiative
3. Faculty advisor for the student-led AI Club
4. Member of the Military & Veteran Affairs Advisory Group

Service at Vanderbilt University

1. Faculty advisor for the "DataBrains" AI and Data Science student club
2. Faculty advisor for the "Vandy Apps" student club
3. Faculty advisor for the "BizTech" student club.
4. Led the effort to create an online Professional Master's in CS

5. Led the effort to create a continuing education program in Web Development
6. Interview panel for the Director of Professional Programs in VUSE
7. Served on the Digital Literacy committee
8. Chair of two-year review committee for Taylor Johnson
9. Chair of the CS search committee in 2003, 2005, 2013, 2016, 2018
10. Chair of the committee on Big Data for the VUSE Strategic Plan
11. Member of the Provost's Special Task Force of the Data Science Visions Working Group: Trans-institutional Master's in Data Science.
12. Member of the Provost's Data Science Visions working group
13. VUSE representative for the Research IT committee
14. VUSE representative on the Provost's Digital Literacy committee
15. Reviewer for University Course proposals
16. Faculty mentor for "Accenture Garage Program"
17. VUSE representative for the Research IT committee.
18. Member of the search committee for the first Director of the Innovation Center
19. Member of the Provost's Study Group on Cross College Teaching
20. Member of the Advisory Committee for the Vanderbilt Institute for Digital Learning (VIDL)
21. Chair of the Provost's Committee on the Innovation Center
22. Member of the VUSE Career Committee
23. VUSE point of contact for VUIT
24. Committee member for Eugene Vorobeychik's promotion case to associate professor
25. Committee member for Bobby Bodenheimer's promotion case to full professor
26. Committee member for Julie Adams's promotion case to full professor
27. Committee member for Akos Ledeczi's promotion case to full professor
28. Chair of the tenure committee for Yuan Xue
29. Chair of the four-year review committee for Yuan Xue
30. Member of the two-year committee for Yuan Xue
31. Member of the promotion committee for Ted Bapty
32. Member of review committee for Xenofon Koutsoukos
33. Chair of promotion committee for Gabor Karsai
34. Member of promotion committee for Gautam Biswas
35. Chair of the VUSE Technology Entrepreneurship Task Force
36. Member of the VUIT faculty advisory committee
37. Owen-VUSE joint committee for 2014-2015
38. Chair of the Schmidt Family Annual Educational Technologies Lectureship
39. Member of the Provost's Study Group on Cross College Teaching
40. Chair of two-year review committee for Eugene Vorobeychik
41. Member of the Chancellor's Social Media and the Internet committee
42. Member of the VU Online Education Task Force
43. Member of the ad hoc committee on EECS Industrial Advisory Board
44. Ex-officio member of the ad hoc committee on the CS graduate program

45. Ex-officio member of the ad hoc committee on the CS undergraduate program
46. Faculty facilitator for the Vanderbilt Visions program
47. Chair of the Information Technology committee for the Vanderbilt School of Engineering
48. Chair of the tenure committee for Bobby Bodenheimer
49. EECS Corporate/Internship Liaison for Computer Science and Engineering
50. Ex-officio Member of the Ad Hoc Committee on Computer Engineering
51. Faculty sponsor of the new EECS Graduate Student Organization
52. Member of the VUSE Research Institutes and Centers Council
53. Associate Chair of Computer Science and Engineering
54. Member of the Vanderbilt University Faculty Senate
55. Chair of the faculty committee on Academic Computing and Information Technology (ACIT)
56. Member of the Research Advisory Committee on Information Technology (RACIT)
57. Chair of the Systems Engineering concentration committee
58. Member of the Plan Integration and Communication Group (PICG)
59. Member of the CS graduate curriculum commitee

Service at Washington University, St. Louis

1. Member of the Faculty recruiting committee
2. Member of the CS committee on recruiting industrial graduate students (RIGS)
3. Member of the CS Experimental Infrastructure for Teaching and Research (CEITR)
4. Member of the Introductory course committee
5. Member of the Graduate admission committee
6. Member of the CS representative to the CEC advisory board
7. Member of CS departmental chair search committee

Honors and Awards

1. Selected as a 2025–2026 Inclusive Excellence Champion at William & Mary.
2. Elected to the Virginia Academy of Science, Engineering, and Medicine (VASEM), July 2025.
3. Inducted into the Information and Computer Science (ICS) Hall of Fame at the University of California, Irvine.
4. Nominated by President Biden and unanimously confirmed by the United States Senate to become the Director of Operational Test and Evaluation for the United States Department of Defense, February 2024.
5. Received the 2023 AJ Award for Leading and Advancing from the Software Engineering Institute at Carnegie Mellon University for my work on the Long Range Stand Off (LRSO) project.
6. Received the 2022 AJ Award for Leading and Advancing from the Software Engineering Institute at Carnegie Mellon University for my work on the "Architecting the Future of Software Engineering: A National Agenda for Software Engineering Research & Development" study.
7. Received the Cornelius Vanderbilt Professor of Engineering endowed chair in February 2017.
8. Received the 2015 Award for Excellence in Teaching by the Vanderbilt University School of Engineering.
9. Interviewed for Software Engineering Radio (www.se-radio.net/).
10. Vice-chair of the IEEE Chapter in middle Tennessee.
11. Elected to three-year term as member of the Vanderbilt University Faculty Senate.
12. Invited speaker at the dedication of the Henry Samueli School of Engineering, along with UC Irvine

Chancellor, Ralph Cicerone; Dean of the School of Engineering, Nicolaos Alexopoulos; Chairperson of the Regents of the University of California, S. Sue Johnson; President of the University of California, Dick Atkinson; and CTO and co-founder of Broadcom Henry Samueli.

13. Interviewed for Dr. Dobb's journal TechNetCast, October 24, 2000.
14. Interviewed for **iX** magazine, October, 2000.
15. Received early promotion to tenure as an Associated Professor at Washington University, St. Louis, five years after joining the faculty as an Assistant Professor in 1994.
16. Director of the "Center for Distributed Object Computing" at Washington University, St. Louis since spring of 1999.
17. Listed in Marquis' "Who's Who in Media and Communications," 1997.
18. Received joint appointment to the Mallinckrodt Institute Department of Radiology, Washington University School of Medicine, February 1996.
19. Selected to participate in the ACM OOPSLA '94 Doctoral Symposium.
20. Invited by Dr. Martina Zitterbart to participate in a 4-week international exchange program at the Universität Karlsruhe Institut für Telematik in Karlsruhe, Germany, April 1993.
21. Served as elected representative to the Associated Graduate Student organization at the University of California, Irvine from May 1991 to June 1992.
22. Served as elected graduate student representative to the Computer Science Computing Resource Committee at the University of California, Irvine from August 1988 to August 1990.

Consulting and Expert Work

1. ARINC, Fountain Valley, CA
2. ACM, NY, NY
3. Advanced Institute of Information Technology, Seoul, Korea
4. AG Communication Systems, Phoenix, AZ
5. Anderson Consulting, Chicago, IL
6. Apple, Cupertino, CA
7. AT&T Research, Murray Hill, NJ
8. BAE Systems, Greenlawn, NY
9. BAE Systems, Wayne, NJ
10. Bartlit Beck, Chicago, IL
11. BEA, San Jose, CA
12. Bellcore, Morristown, NJ
13. BellSouth, Atlanta, GA
14. Boeing, St. Louis, MO
15. Boies, Schiller, & Flexner, Santa Monica, CA
16. Bureau Brandeis, Amsterdam, Netherlands
17. Bridges & Mavrakakis, Palo Alto, CA
18. Cooley LLP, San Francisco, CA
19. Correct Care Solutions, Nashville, TN
20. Credit Suisse, Zurich, Switzerland
21. Cooley, Boston, MA
22. Cravath, Swaine, & Moore, NY, NY
23. Crosskeys, Ottawa, Canada

24. DARPA, Arlington, VA
25. Desmarais, NY, NY
26. Duane Morris, Atlanta, GA
27. Edward D. Jones, St. Louis, MO
28. Envision Inc. St. Louis, MO
29. Ericsson, Cypress, CA
30. Fitzpatrick, Cella, Harper & Scinto, NY, NY
31. Fish and Richardson, Boston, MA
32. GaN Corporation, Huntsville, AL
33. Gibson, Dunn, & Crutcher, NY, NY
34. Goldman, Ismail, Tomaselli, Brennan, & Baum, Chicago, IL
35. Guidepoint, Boston, MA
36. Hogan & Lovalls, Washington DC
37. Jet Propulsion Lab, Pasadena, CA
38. Kasowitz, Benson, & Torres, Redwood Shores, CA
39. Keystone Strategy, Boston, MA
40. Kilpatrick Stockton, Atlanta, GA
41. Kirkland & Ellis, San Francisco, CA
42. Kodak Imaging, Rochester, NY
43. Latham & Watkins, Washington DC
44. Laureate University, Baltimore, MD
45. Lee Sullivan Shea & Smith, Chicago, IL
46. Lockheed Martin Tactical Systems, Minneapolis, MN
47. Lockheed Martin Mission Systems, Boulder, CO
48. Lockheed Martin Advanced Technology Lab, Cherry Hill, NJ
49. Lucent Bell Labs, Naperville, IL
50. Lucent Bell Labs, Murray Hill, NJ
51. Lucent, Whippany, NJ
52. McDonnell Douglas, St. Louis, MO
53. Microsoft, Redmond, WA
54. Morrison & Foerster, Washington DC
55. Morgan Stanley, New York, NY
56. Motorola Cellular Infrastructure Group, Arlington Heights, IL
57. Motorola Iridium, Chandler, AZ
58. Motorola Land Mobile Products, Chicago, IL
59. National Security Agency, Ft. Meade, MD
60. Naval Air Weapons Stations, China Lake, CA
61. Nelson Mullins, Houston, TX
62. Nortel, Ottawa, Canada
63. Object Computing Institute, St. Louis, MO
64. Object Technologies International, Ottawa, CA

65. Odetics Broadcasting, Anaheim, CA
66. Oracle, Redwood Shores, CA
67. Orrick, Los Angeles, CA
68. Park, Vaughan, & Fleming, Boise, ID
69. Pearson Education, London, UK
70. Pragmatus, Alexandria VA
71. PrismTechnologies, Newcastle, UK
72. Qualcomm, San Diego, CA
73. Quinn Emanuel, NY, NY
74. Raytheon, San Diego, CA
75. Reichman Jorgensen, CA
76. Riverace, Boston, MA
77. Rubin Anders Scientific, Boston, MA
78. SAIC, Washington D.C.
79. Schafer Corp, Washington D.C.
80. Schwegman, Lundbert, & Woessner, Minneapolis, MN
81. Skadden, Arps, Slate, Meagher & Flom, NY, NY
82. Securboration, Melbourne, FL
83. Siemens Medical Engineering, Erlangen, Germany
84. Siemens Corporate Research, Princeton, NJ
85. SIGS, New York, NY
86. Software Engineering Institute, Pittsburgh, PA
87. Teradyne, Chicago, IL
88. Teledyne, Thousand Oaks, CA
89. UC Berkeley Extension, Palo Alto, CA
90. UCLA Extension, Los Angeles, CA
91. USENIX, Lake Forest, CA
92. Venable, NY, NY
93. Wong, Cabello, Lutsch, Rutherford & Brucculeri, Houston, TX
94. WMS Gaming, Chicago, IL
95. Zircon Computing, Wayne, NJ

Expert Testimony

1. March 2016, Deposed in support of Oracle in the Oracle vs. Google Fair Use trial in the United States District Court for the Northern District of California, San Francisco division. Case No. Civ. A. No. 10-03561 WHA.
2. May 2016, Testified in support of Oracle in the Oracle vs. Google Fair Use trial in the United States District Court for the Northern District of California, San Francisco division. Case No. Civ. A. No. 10-03561 WHA.
3. February 2017, Deposed in support of IBM in the IBM vs. Priceline Group case. Case No. Civ. A. N. 15-cv-137-LPS-CJB.
4. February 2018, Deposed in support of IBM in the IBM vs. Groupon case. Case No. Civ A. N. 16-122-LPS-CJB.
5. July 2018, Testified in support of IBM in the IBM vs. Groupon case. Case No. Civ A. N. 16-

122-LPS-CJB.

6. August 2018, Deposed in support of Palo Alto Networks in the Palo Alto Networks vs. Implicit case. Case No. Civ 6:17-CV-182-JRG.
7. January 2019, Deposed in support of C3IoT in the E2.0 vs. C3IoT case. Case No. 1:15-cv-00530-GMS.
8. February 2019, Testified in support of C3IoT in the E2.0 vs. C3IoT case. Case No. 1:15-cv-00530-GMS.
9. June 2019, Deposed in support of IBM in the IBM vs. Expedia Inc. case. Civil Action No. IPR2018-01136.
10. July 2019, Deposed in support of Philips in the Philips vs. Microsoft case. Civil Action No. 4:18-cv-01885-HSG.
11. August 2019, Deposed in support of Philips in the Philips vs. HTC case. Civil Action No. 4:18- cv-01885-HSG.
12. August 2019, Deposed in support of Philips in the Philips vs. ASUS case. Civil Action No. 4:18-cv-01885-HSG.
13. September 2019, Deposed in support of Kroy in the Kroy vs. Groupon case. Civil Action No. IPR2019-00044.
14. September 2019, Deposed in support of Kroy in the Kroy vs. Groupon case. Civil Action No. IPR2019-00061.
15. March 2020, Deposed in support of Cisco in the Centriptal vs. Cisco case. Civil Action No. 2:18-cv-00094-HCM-LRL.
16. May 2020, Testified in support of Cisco in the Centriptal vs. Cisco case. Civil Action No. 2:18-cv-00094-HCM-LRL.
17. Jan 2021, Deposed in support of Droplets in the Droplets vs. Yahoo case. Civil Action No. 12-CV-03733-JST.
18. Jan 2021, Deposed in support of Droplets in the Droplets vs. Nordstrom case. Civil Action No. 12-CV-04049.
19. June 2021, Deposed in support of Sonos in the Sonos vs. Google case. Civil Action No. 6:20-cv-00881-ADA.
20. September 2021, Deposed in support of IBM in the IBM vs. Zillow case. Civil Action No. IPR2020-01655.
21. November 2021, Deposed in support of Apple in the Apple vs. Identity Security case. Civil Action No. 6:21-CV-460-ADA.
22. January 2022, Deposed in support of IBM in the IBM vs. Chewy case. Civil Action No. 1:21-cv-01319-JSR.
23. February 2022, Deposed in support of Droplets in the Droplets vs. Yahoo case. Civil Action No. 12-CV-03733-JST.
24. March 2022, Deposed in support of Sonos in the Sonos vs. Google case. Civil Action No. 3:21-cv-7559.
25. March 2022, Testified in support of Droplets in the Droplets vs. Yahoo case. Civil Action No. 12-CV-03733-JST.
26. May 2022, Deposed in support of the plaintiffs in the Google Play Consumer Antitrust Litigation. Civil Action No. 3:20-cv-05761-JD.
27. July 2022, Deposed in support of the State of Arizona in the State of Arizona vs Google case. Civil Action No. CV2020-006219.
28. July 2022, Deposed in support of Johnson and Johnson in the Johnson and Johnson vs Alcon case. Civil Action No. 20-842 (CFC) (JLH).
29. July 2022, Deposed in support of LinkedIn in the LinkedIn vs. hiQ case. Civil Action No. 17-cv-03301-EMC.

30. August 2022, Deposed in support of Salesforce in the Salesforce vs. Applications in Internet Time case. Civil Action No. 3:13-CV-00628-RCJ-CLB.
31. January 2023, Deposed in support of Csupo et. al in the Attila Csupo, Andrew Burke, and Kerry Hecht v. Alphabet case. Civil Action No. 19CV352557.
32. February 2023, Deposed in support of Sonos in the Google vs. Sonos case. Civil Action No. 3:20-cv-06754-WHA.
33. April 2023, Deposed in support of Carr et. al in the Google Play Consumer Antitrust Litigation, Case No. 3:20-cv-05761-JD.
34. April 2023, Deposed in support of Carbonite Inc, in Ruben A. Luna et al. V. Carbonite, Inc. Mohamad S. Ali, and Anthony Folger, Case No. No. 19-cv-11662-LTS.
35. June 2023, Testified in support of Sonos in the Google vs. Sonos case. Civil Action No. 3:20-cv-06754-WHA.
36. August 2023, Deposed in support of Salesforce in the Salesforce vs. WSOU case. Civil Action No. 6:20-cv-01164-ADA.
37. September 2023, Deposed in support of Vector Flow in HID Global Corporation vs. Vector Flow, Inc. et al., Civil Action No. Civil Case No. 21-1769.
38. September 2023, Deposed in support of IBM in IBM vs. Rakuten, Civil Action No. 21-00461-GBW.
39. November 2023, Deposed in support of Title Source, Inc in Title Source, Inc vs. HouseCanary, Civil Action No. 2016-CI-06300.
40. February 2024, Testified in support of Vector Flow in HID Global Corporation vs. Vector Flow, Inc. et al., Civil Action No. Civil Case No. 21-1769.
41. February 2024, Deposed in support of Salesforce in WSOA Investments vs. Salesforce, Civil Action No. 6:20-cv-01165-ADA.
42. April 2024, Deposed in support of the State of Texas in the State of Texas vs. Google, Civil Action Cause no. 22-01-88230-D.
43. April 2024, Testified in support of the State of Texas in the State of Texas vs. Google, Civil Action No. Cause no. 22-01-88230-D.
44. June 2025, Testified in support of Csupo et. al in the Attila Csupo, Andrew Burke, and Kerry Hecht v. Alphabet case. Civil Action No. 19CV352557.
45. January 2026, Deposed in support of Title Source, Inc in Title Source, Inc vs. HouseCanary, Civil Action No. 2016-CI-06300.
46. March 2026, Testified in support of Title Source, Inc in Title Source, Inc vs. HouseCanary, Civil Action No. 2016-CI-06300.

Summary of Professional Accomplishments and Impact

Since graduating with my Ph.D. in 1994, I have led influential R&D efforts at William & Mary, Vanderbilt University, Carnegie Mellon University's Software Engineering Institute (SEI), the Defense Advanced Projects Research Agency (DARPA), the University of California Irvine, and Washington University St. Louis.

Research Contributions and Impact

At Vanderbilt University, I was a Senior Researcher at the Institute for Software Integrated Systems, which conducts world-class research on model-driven engineering (MDE) tools and middleware platforms for intelligent cyber-physical systems (CPS) and mobile cloud computing applications. Over the past three decades I led research projects on a range of topics, including patterns, optimization techniques, and empirical analyses of software frameworks that facilitate the development of quality of service (QoS)- enabled middleware and MDE techniques/tools for cyber-physical systems and mobile cloud computing applications running over wired/wireless networks and embedded system interconnects. Recently my research focused on prompt engineering techniques and patterns that enhance the accuracy and expressiveness of large language models (LLMs) and generative augmented intelligence (AI+) platforms.

The research approach throughout my career has generally involved:

- *Creating* innovative middleware, MDE, and AI+ technologies, such as design formalisms, prompt

patterns, QoS specification-/enforcement techniques, end-to-end and cross-layer middleware optimizations, and automated tools for specifying, analyzing, and synthesizing dependable software from higher-level domain-specific models and LLM prompts.

- *Applying* these technologies in conjunction with multi-disciplinary teams of colleagues in academia and industry to demonstrate and mature middleware, MDE, and AI+ technologies and tools in the context of research and production mission-critical cyber-physical systems and mobile cloud computing applications.
- *Amplifying* the adoption and transition of these technologies in academia and industry via 650+ publications, 675+ tutorials and invited talks, millions of lines of popular open-source software, and scores of innovative face-to-face and online courses published and delivered to more than 400,000 students around the world.

The R&D efforts I led have had a significant impact on academic research and commercial practice. For example, dozens of universities throughout the world use the middleware, MDE, and AI+ tools my research group has developed as the basis for their research and teaching efforts. Moreover, the open- source middleware frameworks, MDE, and AI+ tools generated from projects I've led constitute some of the most successful examples of software R&D ever transitioned from research to industry, being widely used by thousands of companies and agencies worldwide in many domains for three decades.

In particular, the ACE and TAO middleware frameworks developed by the DOC Group are used by developers in thousands of companies (such as Boeing, Cisco, Ericsson, Facebook, Kodak, Lockheed Martin, Lucent, Mercedes-Benz, Motorola, NASA/JPL, Nokia, Nortel, Raytheon, SAIC, Siemens, Sprint, and Telcordia) in a wide range of domains (such as telecom/datacom, healthcare, process automation, avionics, homeland security and defense, financial services, online gaming, social media, and distributed interactive simulation).

For example, my work on middleware for cyber-physical systems has transitioned to the Joint Tactical Terminal (JTT) and Joint Tactical Radio System (JTRS) software defined radio programs, manned/unmanned com-bat air vehicles, the Orbital Express low earth orbit (LEO) satellite telemetry and control framework, the Ground Support System (GSS) for the X33 Single Stage To Orbit (SSTO) Reusable Launch Vehicle, and the USS Ronald Reagan ship self-defense system (SSDS), the USAF upgraded early warning radar system, the DMSO HLA/RTI and DISA TENA distributed interactive simulation middleware, among many other DoD applications.

Likewise, my work on enterprise dynamic resource management algorithms, component deployment and configuration middleware for system integration, and model-based tools for system execution modeling and performance analysis has transitioned to many DoD acquisition programs, including the Navy's DDG 1000 Land Attack Destroyer and AEGIS Open Architecture initiative.

Teaching Contributions and Impact

I have taught scores of cutting-edge courses on topics relating to object-oriented design and programming, software patterns, middleware for distributed real-time and embedded systems, concurrent and networked programming with C++ and Java, and mobile cloud computing with Android. I received the 2015 Award for Excellence in Teaching by the Vanderbilt University School of Engineering. In addition, I've taught 10 popular MOOCs at Vanderbilt on topics related to pattern-oriented mobile cloud computing with Android to over 400,000 learners from around the world.

I co-taught one of the first cross-college University Courses at Vanderbilt on "Tackling Big Problems with Mobile Cloud Computing," where ten highly diverse teams consisting of 11 arts and science students and 44 computer science students were mentored by 11 faculty from the College of Arts and Sciences, the School of Nursing, the School of Law, the School of Medicine, the School of Engineering and Vanderbilt University Medical Center. The projects in this course addressed relevant, real-world problems involving mobile cloud computing technologies, including:

- Effectively engaging young people with chronic diseases and medical conditions, such as diabetes, asthma and obesity
- Creating "smarter" cities and sustainable energy platforms via an app-based transportation hub for Nashville, and remotely monitoring the safety and operations of novel sources of power, including solar, wind and natural gas, and
- Helping economically disadvantaged individuals bridge the digital divide to obtain better guidance on medical and legal matters.

University Leadership and Service

I have engaged in the following service and leadership capacities at William & Mary and Vanderbilt University during the past two decades:

- **Dean of the School of Computing, Data Sciences, and Physics at William & Mary**. Report to the Provost and am responsible for (1) uniting the school's four areas (computer science, data science, applied science and physics) into a cohesive academic unit and growing their research, grant funding and doctoral program enrollment, (2) establishing a vision with strategic objectives to ensure the school becomes nationally known as an inclusive and innovative leader in teaching and research, and (3) supporting faculty in their research, teaching and service work; leading fundraising efforts and the financial management of the school; and building or strength- ening its strategic partnerships.
- **Associate Provost for Research**. I served as the Associate Provost for Research at Vanderbilt University from July 2018 to June 2022. In this capacity I developed cohesive and sustainable information technology (IT) services and governance frameworks to advance research and scholarship across Vanderbilts ten schools and colleges, including scalable and secure storage, processing, and communication solutions; big data research cores and correlated services, and regulatory- compliant IT services (such as data governance frameworks in accordance with GDPR and NIST 800-171 compliance regimes). I also oversaw Vanderbilt's "software-research-engineer for hire" service that provides researchers with on-demand access to shared technology expertise, which helps them develop research IT solutions, especially with data-intensive workflows, while also enabling shared developers to add value to multiple research programs throughout Vanderbilt. In my capacity as the Associate Provost for Research I chaired the Digital Services and Projects Working Group and Research IT Faculty Advisory Committee, which evaluates digital services and project support available across campus and assesses future needs to create a range of research-oriented tools and products, including online content and videos, digital collections and archives, dashboards, research gateways, and data visualizations.
- **Data Sciences Initiatives**. I am deeply involved in Vanderbilt's initiatives on Data Science. From August 2018 to June 2022, I served as a founding Co-Director of the Data Science Institute at Vanderbilt (which focuses on graduate students). I also served as the Director of the Data Science Minor (which focuses on undergraduate students) during 2021. During the past several years I co-chaired Data Science: Next-Generation committee on behalf of the Vanderbilt Provost. I also served as a member of the ad hoc committee on Big Data for the Vanderbilt University School of Engineering (VUSE) strategic planning process, as well as served on the Provost's Special Task Force on a trans-institutional Master's in Data Science and the Provost's Working Group on Data Science Visions, which sets the direction for trans-institutional Data Science research. In addition, I created and gave a presentation on "Big Data" for the Vanderbilt University Board of Trust in the spring of 2017 that helped initiate Vanderbilt's investment in the Data Science Institute.
- **EECS and CS Department Leadership**. I served as the Associate Chair of the Electrical Engineering and Computer Science (EECS) department at Vanderbilt University from 2004 to July 2018 and as the Associate Chair of the Computer Science department at Vanderbilt University from July 2022 to the present. In this capacity I worked with the EECS and CS Chair to provide intellectual leadership and assist in EE, CS, and CompE faculty hiring, curricular development, and course staffing. I also represented Vanderbilt at the bi-annual CRA "CS Chairs" meeting at Snowbird Utah from 2008 to 2018. My recent focus is on innovative digital learning techniques (such as pre-recording material and/or recording lectures in class so students can watch to them at their leisure to ensure they master the course material) to handle the surge in undergraduate CS enrollment without adversely affecting Vanderbilt's commitment to high quality education. I also spearheaded several initiatives to create a continuing education program focused on web development in partnership with Trilogy Education Services and a professional master's degree program in CS.
- **Digital Learning**. I have played a significant role in Vanderbilt's digital learning initiatives, including teaching (1) the first Massive Open Online Course (MOOC) at Vanderbilt in 2013 on "Pattern-Oriented Software Architecture for Concurrent and Networked Systems", (2) the first trans-institutional MOOC Specialization (together with the University of Maryland, College Park) in 2014 on "Mobile Cloud Computing with Android", (3) Coursera Specializations on "Android App Development" since the spring of 2016 and "Scalable Microservices for Developers" since the fall of 2023, and (4) an online Computer Science professional master's degree that Fortune magazine ranked #1 in 2022. I also played a key role in formulating the Vanderbilt digital learning strategy as a member of the Advisory Committee for the Vanderbilt Institute for Digital Learning (VIDL), a member of the Provost's Online Education Committee, a member of the Vanderbilt Online Education Task Force, a member of the Chancellor's Social Media and the Internet committee, chair of the Schmidt Family Annual Educational

Technologies Lectureship, and a member of the Provost's committee on Digital Literacy that ensures all Vanderbilt students learn computational thinking in their undergraduate experience.

- **Cross-College Teaching**. I led Vanderbilt University's forays into Cross-College teaching, where I served on the Vanderbilt Online Education committee and served as a member of the Provost's Study Group on Cross College Teaching, which formulated the concept of "University Courses" that brings faculty from multiple schools to actively engage students of diverse backgrounds and promote new and creative trans-institutional learning. I also created/taught one of the first University Courses on "Tackling Big Problems with Mobile Cloud Computing." In 2016 and 2017 I taught this course in a multidisciplinary environment where students from multiple schools teamed with computer science students to address questions like how mobile cloud computing technologies can engage young people with chronic diseases; change political discourse in the United States and around the world; and help economically disadvantaged individuals bridge the digital divide to obtain better guidance on nutrition and legal matters. I also spearheaded the effort to create a Computer Science course on "the beauty and joy of computing" and a Data Science course on "Introduction to Generative AI" to teach computational thinking to non-CS majors at Vanderbilt University.

- **Information Technology Infrastructure for Research**. Over the past two decades I've held leadership roles in the Vanderbilt University Information Technology (VUIT) planning and governance processes, most recently as a member of the Provosts IT Risk Committee. In my role as the Associate Provost for Research (see above) I oversaw the high-performance computing cloud capabilities at Vanderbilt's Advanced Computing Center for Research and Education (ACCRE). I also chaired the faculty committee on Academic Computing and Information Technology (ACIT), served as the Vanderbilt University School of Engineering (VUSE) point of contact for VUIT, the VUSE representative for the Research IT committee, as well as served as a member of the VU Computer Security Incident Response Team that manages and supports the overall response process associated with impactful security incidents, a member of the Research Advisory Committee on Information Technology (RACIT), and a member of the Provost's Research IT Special Project Working Group, which focuses on supporting the research needs of all schools at Vanderbilt.

- **Entrepreneurship.** I have been deeply involved in entrepreneurial activities throughout my ca- reer. I led the Vanderbilt University School of Engineering (VUSE) Technology Entrepreneurship Task Force, which enhanced the high-tech eco-system in Nashville by helping students, faculty, and staff launch startup companies in the region. I was also part of the committee that established Vanderbilt's innovation center called the Wond'ry and have served as a mentor for high-profile entrepreneurial activities held at the Wond'ry, including the Accenture-sponsored "Innovation Garage" program. In addition, I served as the Chief Technology Officer and/or consultant for several companies that commercialized the ACE and TAO middleware platforms based on my re- search distributed real-time and embedded systems, which has generated over 200 million dollars of revenue during the past three decades.

- **Inclusive Excellence initiatives.** In my roles at Vanderbilt University and William & Mary, I have spearheaded specific initiatives to cultivate a more inclusive community. Recognizing the underrepresentation of women and minorities in engineering fields, I led efforts to revamp the Computer Science and Data Science curricula, e.g., by introducing inter-disciplinary courses that address broader societal impacts of computing and data analytics, which attracted a broader demographic of students. I've collaborated with faculty to integrate inclusive teaching practices and offer workshops that highlight the contributions of diverse scientists and technologists. In addition, I've mentored students from varied backgrounds and created scholarship programs that remove financial and cultural barriers that often discourage these students from pursuing engineering disciplines. These efforts are central to my broader goal of enriching the educational experience at Vanderbilt University and William & Mary, fostering a learning environment where every student can thrive and see themselves as future leaders in engineering. My belief in the transformative power of education drives my ongoing commitment to develop academic communities that are as varied and vibrant as the society they serve.

Professional Leadership

I have engaged in the following professional leadership capacities over the past three decades:

- **Government Leadership**. I was nominated by President Biden and unanimously confirmed by the United States Senate in 2024 to serve as the Director of Operational Test and Evaluation (DOT&E), reporting to the Secretary of Defense. This position was responsible for assessing the effectiveness, suitability, survivability, and (when necessary) lethality of United States military systems. From 2000 to

2003 I served as a Program Manager at the DARPA Information Technology Office (ITO) and Information eXploitation Office (IXO), as well as the Deputy Director for DARPA ITO. In these roles I led the national R&D effort on QoS-enabled middleware for cyber-physical systems (CPS), including the Total Ship Computing Environment for the US Navy's DDG 1000 Land Attack Destroyer program and AEGIS Open Architecture program, as well as several US Air Force time-critical targeting programs. From 2001 to 2003 I served as Co-chair (together with Frank Anger from the NSF) for the Software Design and Productivity (SDP) Coordinating Group. In this role I helped to formulate the multi-agency research agenda in large-scale, high confidence software design for the Federal government's Network and Information Technology Research and Development (NITRD) Program, which is the collaborative IT research effort of the major Federal science and technology agencies.

- **Government Service**. From 2010 to 2014 I served a member of the Air Force Scientific Advisory Board, where I was the Vice Chair of a study on Cyber Situational Awareness for Air Force mission operations and a member of a study on processes, methods, and tools for effectively sustaining aging aircraft at US Air Force maintenance and sustainment depots. From 2013 to 2015 I served on the Advisory Board for the joint US Navy/Army Future Airborne Capability Environment (FACE). From 2013 to 2015 I served as co-lead for the US Navy's Open Systems Architecture initiative task area on "Published Open Interfaces and Standards". Since 2017 I provided software and systems engineering expertise on multiple DoD enterprise computing projects, including the Navy PEOSUB program, the Air Force AWACS and E7 programs, and joint Missile Defense Agency (MDA) program, the Air Force Ground Based Strategic Defense (GBSD) program, and the Air Force Long-Range Stand Off (LRSO) program.
- **FFRDC Leadership**. From 2010 to 2012 I served as the Deputy Director of Research and Chief Technology Officer of the Federally Funded Research & Development Center (FFRDC) known as the Software Engineering Institute (SEI) at Carnegie Mellon University (CMU). In this role I formulated the SEI's strategy for research and acquisition projects by aligning the expertise of the SEI technical staff to identify/respond to the needs of sponsors, customers, and partners in software engineering and cyber-security. During this time period I also co-led efforts in other US government agencies and FFRDCs (such as NIST, MITRE, Aerospace, and Lincoln Labs) to shape future innovations in complex software-reliant system development, certification, and deployment. I continue to work with the CMU SEI as a Visiting Scientist, where I have helped formulate the Generative AI research strategy for the Software Solutions Division (SSD).
- **Industry Leadership**. From 2006 to 2010 I served as the Chief Technology Officer for two companies, Zircon Computing (2009 to 2010), and Prism Technologies (2006-2008). As CTO I directed the technical vision and strategic R&D investments for these companies in the domains of enterprise and embedded distributed real-time and embedded systems. From 2014 to 2017 I served on the Board of Directors for Real-Time Innovations (RTI), which is a leader in QoS-enabled middleware for the Industrial Internet of Things.

Measures of Career Accomplishments

Measures of my career accomplishments include the following:

- **Publications and presentations.** I have published 700+ works (141 journal papers, 219 confer- ence papers, 5 books, 5 book-length reports, 3 edited book collections, 70 book chapters, 75 workshop papers, 167 trade magazine and newsletter/blog articles, 32 editorials and book forewords, and 14 short papers and posters). My papers have appeared in the most selective journals (*e.g.*, ACM Transactions in Embedded Computing Systems, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Software Engineering, IEEE Transactions on Computing, IEEE Journal of Selected Areas of Communications, and ACM Transactions on Autonomous and Adaptive Systems) and conferences (*e.g.*, ACM SIGCOMM, ACM OOPSLA, IEEE INFOCOM, IEEE ICDCS, IEEE RTAS, ACM/IEEE Middleware, and the ACM/IEEE ICSE) in my field. I have also given 675+ invited talks and tutorials world-wide.
- **Measures of scholarly impact.** My publications have been cited 53,000+ times across a comprehensive spectrum of high-impact venues. My g-index is 220, my h-index is 96, and my i10 index is 393. These bibliometrics indicate the significant impact of my publications as a researcher in the field of Computing.
- **Funding.** Since June 1995 I have been a PI or co-PI for grants, contracts, and gifts totaling more than $42 million dollars. I have been the sole PI for over $12 million dollars of this amount.
- **Graduate advising and training.** During my academic career I have (co-)advised and graduated 19 doctoral students and over 25 master's students.
- **Professional service and leadership.** In addition to my academic service and leadership roles, I have

engaged in the following government and industry professional service and leadership capacities during my career:

- In 2024 I served as the Director of Operational Test & Evaluation, which is a President-appointed, Senate-confirmed senior leadership position at the United States Department of Defense.
- From 2013 to 2015 I served on the Advisory Board for the joint US Navy/Army Future Airborne Capability Environment (FACE).
- From 2013 to 2015 I served as co-lead of a task area on "Published Open Interfaces and Standards" for the US Navy's Open Systems Architecture initiative.
- From 2010 to 2014 I served a member of the Air Force Scientific Advisory Board, where I was the Vice Chair of a study on Cyber Situational Awareness for Air Force mission operations.
- From 2006 to 2011 I served as the Chief Technology Officer for the Software Engineering Institute at Carnegie Mellon University (2010 to 2011), Zircon Computing (2009 to 2010), and Prism Technologies (2006-2008), where I was responsible for directing the technical vision and strategic R&D investments.
- From 2000 to 2003 I served as a Program Manager at the DARPA Information Technology Office (ITO) and Information eXploitation Office (IXO) the Deputy Director for DARPA ITO, where I lead the national R&D effort on QoS-enabled middleware for DRE systems.
- From 2001 to 2003 I served as Co-chair for the Software Design and Productivity (SDP) Coordinating Group, which formulates the multi-agency research agenda in fundamental software design for the Federal government's Information Technology Research and Development (IT R&D) Program, which is the collaborative IT research effort of the major Federal science and technology agencies.
- Served as general chair or program (co)-chair for 35 conferences, tutorial chair for 4 conferences, co-organized 14 workshops, and served on the program committees for over 245 ACM, IEEE, IFIP, USENIX, and OMG conferences.
- Served as guest editor of 13 ACM, IEEE, and USENIX journals, and served as editor-in-chief of the C++ Report magazine.