



Limbless IUB student makes own Bionic limb

By Ashrafi Anjuman Sneha

“We define who we are, not our circumstances”, that is what this IUB student has proven by contributing to his own bionic arm being developed as a STEMc project in collaboration with the IUB School of Engineering, Fab Lab and Mechamind. Asif Karim Alif is a student of IUB, majoring in CSE, who was born without hands and legs. However, it has never stopped him in life, nor has he ever shied away from challenges, one of them being developing a system that is able to detect gestures like wrist and finger movements that he was never accustomed

to from birth, and training his body to recreate these unfamiliar gestures. A joint team at Fablab and Mechamind has designed a 3D printed EMG signal based bionic arm. This gesture controller uses EMG sensors to measure electrical impulses from muscles in response to a nerve's stimulation and a microprocessor to recognize gestures and hand positions through a neural network-based AI model.

The challenges include signal capturing and processing accuracy, register and design. With the design and simulation complete, they are now

working on the hardware and software programming after which they can fully assemble the arm and move on to human trials to check for safety and security. Alif has been working with the team on sensor communication and the AI aspect alongside brainstorming. He will also be helping in the overall assembly of the arm.

The project is funded by Mechamind and School of Engineering. Contributors in this project include Dr. Mahady Hasan, Mr. Salman Promon, Fahin Uddin, Shoaib Mirza and Asif Karim Alif himself.

EDITORIAL

What is STEMcIUB?

STEM Community, IUB (STEMcIUB) is an independent nonprofit initiative based in Independent University, Bangladesh (IUB) that connects & nurtures students who are passionate about science, technology, engineering, and mathematics (STEM). Our goal is to establish a platform that will connect & engage the students in STEM with the focus of creating an inclusive community that builds innovative and entrepreneurial mindsets to solve real life problems.

This open platform aims to popularize STEM among students to empower them with experiential learning and skill-skets developing opportunities to become the next generation innovators & problem solvers in our developing country.



www.stemiub.online

Artificial Unintelligence

By ChatGPT

As we use AI in our daily human activities more than ever before, it's fair to say that we keep on giving a greater portion of responsibility to these so called intelligent algorithmic computer programs. But stripping away responsibilities from the humans and giving them to AI, are we actually ready for that?

And perhaps more importantly, is AI ready for that? Because who is responsible when AI crashes your self-driving Tesla? Who should take the blame when AI algorithms are inherently biased?

Technochauvinism—the belief that technology is always the solution—arguments can be made that it's just not true that social problems would inevitably retreat before a digitally enabled Utopia. Our collective enthusiasm for applying computer technology to every aspect of life has resulted in a tremendous amount of poorly designed systems.

STEMc IUB joins forces with Darwin India to host Regional Conference 2023

By STEMc Correspondents

The Darwin International Conference organized by Bioridil, India's first DIY biolab, brings together research enthusiasts from across the world every year, providing a platform for cutting-edge research topics, talk sessions by established biologists, hands-on workshops, tours, Research Symposium, and more. STEM Community, IUB collaborated with Darwin India to organize the "Regional Conference" as part of the Darwin International Conference 2023.

The scientific talk session began with keynote speaker Darlington Akogo, founder and CEO of minoHealth, who has developed ScaffoldNet, a tool that aids in the classification of synthetic scaffolds in regenerative medicine. He talked about the use of artificial intelligence and computation in health sciences. The following keynote session was by Dr. Filipe Pereira who established cell fusion and heterokaryons as a new technique to research



cellular reprogramming mechanisms towards pluripotency during his PhD. His talk focused on anti-cancer immunotherapy where he delved into the biochemistry of how cells acquire, maintain, and ultimately change or reverse their identity.

Dr. Xavier Palmer and Dr. Lucas Potter held the third Scientific talk session, discussing their research at the intersection of Biological and Computational Fabrication, and Security Research. The final panel discussion, titled "Integrated technologies and the importance of community science education for sustainable innovations," featured Dr. Walker, a learning scientist

who focuses on the application of new computational and biological technologies in middle and high school curricula, Carolyn Angleton, a biotechnology student who organizes and moderates panels on the global community biolab movement and designs art/science curriculum protocols. and Karolina Sulich, a post-artist who investigates the relationships between people, biology, and technology in her works and promotes open science, moderated by DLS student Ashrafi Anjuman Sneha. Find their panel session talk highlighting biodesign as an integrated technology for education, along with all other sessions at our Facebook and YouTube pages.

STEMc Organized the 1st Women in STEM International Symposium.

By STEMc Correspondents

In December of 2022, STEMcIUB organized an International Symposium titled "Women In STEM: Heroes Among Us", celebrating women in STEM. National and international scientists, researchers, educators and entrepreneurs joined us in the pursuit of upholding the important contributions of women in science.

The three day long program started with a scientific talk session with the brilliant minds- Dr Zeba Islam Seraj (former professor of Department of Biochemistry and Molecular Biology, University of Dhaka, Bangladesh, and Director, Center for Bioinformatics Learning Advancement and Systematic Training/cBLAST), Dr Munima Haque

(Director & Associate Professor of Department of Mathematics and Natural Sciences at BRAC University, Bangladesh), Alejandra Sierra, (Researcher at ICVV Logroño, Spain, and Former President of National Biotech Commission, Guatemala), and Yumna Majeed (Pakistani Space Educator). The role models talked about their work, their personal experiences and challenges faced and offered valuable advice to our audiences.

A panel discussion session featuring Dr Amanda Strawhacker, Bushra E Anjum and Johanna Nystrom mediated by Salman Khan Promon and Tanfia Khan

Disha was held, shedding further light on education and social development. Furthermore, the program included a problem oriented Idea Competition, with an incredible and diverse panel of judges, from entrepreneurs to professors. The winners were announced by a very special guest of honor, Dr. Shamima Karim Choudhury -a Bangladeshi physicist, academician, researcher, and women-in-science advocate.

The event concluded with free online workshops on 3D Printing Basics, and Sequencing & Genomic Data Analysis. Read more about the workshops and the winning idea on page 3.



Dr. Amanda Strawhacker
STEM Education Researcher and Designer
Associate Director of the Early Childhood
Technology (ECT) Tufts University, USA

Bushra E Anjum
Co-founder at
Shapla Wellbeing & Wikkil
Alumni of IUB, Bangladesh

Johanna Nystrom
STEM Educator & Coordinator,
Vetenskapshuset Markaryd
Science Museum, Sweden

Sci-fi Writing Competition Organized for Young Writers

By Md. Sadiq Rahman

STEMcIUB organized a Sci-Fi writing competition for all science enthusiasts to showcase their talent in creative writing. Here the aspiring writers got a chance to win 3k worth of prize money with participation certificates and more. Undergraduate students from all departments were welcome to take part and each of them shared amazing stories.

Mr. Salman Haque, bestselling author and translator was the honorable judge for the competition, which was scored in terms of creativity, quality and audience engagement.

The competition was truly nip and tuck, with the winning story coming out on top being Project Justice by Shadman Ali from the Department of Law. The story mesmerized readers from both outside and inside the institution. Another amazing piece, Clairvoyant, by Aybaz Karim from the EEE Department was the runner up. Find it on page 6. There were other mentionable interesting stories like The Xeno Project, A Day Like A Nightmare, Pandora, A Magical Pen and many more that piqued the readers' interests and truly upheld the passion IUB students have for Sci-Fi.



Image: SCI-FI Story Writing Winner, Shadman Ali

Winning Idea of WiSTEM Symposium Idea Competition

By Mohammad Nahid Al Islam

As part of the Women In STEM: Heroes Among Us Online International Symposium, undergraduates and high school students were invited to participate in the Idea Competition that aimed to solve specific problem areas. Many students presented wonderful ideas based on the many themes of this competition, including "Skill based STEM education system for people with learning disabilities", "Minimising water pollution caused by industrial waste and oil spill", and more.

Amidst other wonderful and innovative ideas, the winning idea was 'Probeen' by Sabrina Monsur of Dhaka Medical College and Asif Billah of BUET,

who proposed a solution to "Physically challenged and elderly friendly home automation". 'Probeen' app provides an economically more accessible alternative to resource intensive old care homes and aims to alleviate loneliness among the elderly community leading to improved well-being.

Aside from storing appropriate medical records, features also include notifying essential vitals for health monitoring and GPS mechanism for monitoring elderly individuals if needed. Personalised lifestyle suggestions can be made to regulate adverse health effects of ageing. A talking companion resembling a known relative for regular



interaction can be generated. The app allows connection to social media groups promoting social engagement and there is an option to receive donations for medical assistance as well. Judges were very pleased with the contest and the overwhelming enthusiasm of the participants.

Find more at www.wistem.info

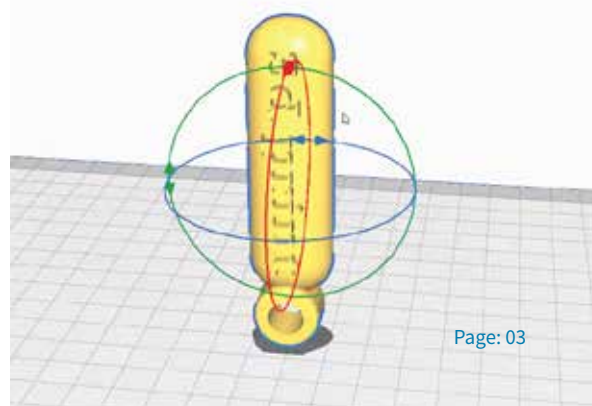
On December 4, the online symposium, Women in STEM, arranged two distinct skill-based workshops, "3D Printing Basics" & "Sequencing and Genomic Data Analysis" for young students and STEM enthusiasts.

The first workshop "3D Printing Basics" was instructed by the CEO of Mechamind, Fahin Uddin Enam. The workshop illustrated the basics of 3D printing, software and tools and basics of 3D printers. It helped the participants get a better understanding of its functions and utilizations. The second workshop on Sequencing and Genomic data Analysis was conducted by Syed Muktadir Al Slyum, scientific officer of BCSIR. This workshop guided the students to learn sequencing data analysis, its application, and the usage of computational software.

More than hundreds of participants registered for both workshops and were benefited by the incredible demonstrations of the trainers. "Thanks to the STEM Community, IUB for organizing such amazing workshops on 3D Printing Basics and Genome Sequencing & Data Analysis. Undoubtedly it was a very informative session for us and I'm grateful for getting the chance to participate.", expressed Rokaya Zannat, one of the participants. The workshops were successfully concluded with the accomplished vision of inspiring and involving the students in learning alongside academia.

WiSTEM organized Free Skill-Based Workshops

By Tanfia Khan Disha



DURBIN: DUR BISSHER NAGORIK

By STEMc Correspondents



Dr. Khan M. B. Asad, Assistant Professor in Astronomy and Astrophysics at Independent University, Bangladesh (IUB), spoke with STEM-clUB about the Durbin project.

The Durbin project, a joint collaboration with the University of Toronto, saw two Unistellar eVscope eQuinox Telescopes for deep sky imaging brought to IUB. The project is inspired by Dr. Lamia Maula, who is a postdoctoral research fellow at Dunlap Institute of Astronomy and Astrophysics, University of Toronto, a result of DUNLAP Institute's grant for global outreach through her Doctorate Program.

Larger telescopes allow us to detect supernova explosions but cannot make follow up observations for hours on end. Smaller more portable telescopes can be distributed to thousands of people as part of a "Citizen science" project with the collected data being analyzed by scientists allowing them to track astronomical bodies including supernova explosions from different locations on Earth.

"The eQuinox telescopes stand apart due to a combination of the mirror, sensor, and internal microcomputer, which processes the collected photos even in places with light pollution, distinguishing between skylight and light pollution. It is incredibly portable, weighing only 9kg when the tripod is added. Most galaxies must be

observed from remote locations, but many within our galaxies are observable using this telescope." - shared Dr. Khan Asad.

"We are part of something really big, not just our Earth but our entire galaxy"

This astronomy project provides a unique opportunity for students to gain valuable skills and experiences by traveling to remote areas and taking breathtaking photos of the night sky. Aspiring astronomers can gain a head start towards success among the stars, and 16 national volunteers will work together to plan outreach activities and capture stunning photos for sharing through various media channels. Additionally, the project aims to empower students through early exposure to research.

"National volunteers may be contacted and there can be regional volunteers to organize events all over Bangladesh or partake in the Citizen Science projects." - Said Dr Khan Asad.

On March 9th, 2023, the Durbin project was inaugurated with a screening of the telescope screen at the IUB auditorium.

The astronomy nights shall continue and observations made by volunteers in various locations, such as the hill tracts of Chittagong, can be shared through screens online during night-long observation sessions. However, to ensure the success of this endeavor, numerous precautions must be taken. "Secure locations must be identified for overnight stays during photo-taking, as continuous observation over a prolonged period is necessary, especially for females", he said.

Apart from that to assess the success of the project, several factors must be considered, including the efficacy of outreach events and the outcome of the citizen science project. Another potential criterion is the identification of exoplanets near stars. Although this telescope is not designed for discovering new planets, it can be utilized to observe known exoplanets during their transit in front of stars. By capturing precise images of this phenomenon, the telescope's efficiency can be evaluated, as well as the suitability of the atmosphere in Bangladesh for astronomy and the optimal months for observations. After the project's completion, scientific data can be analyzed to comprehensively evaluate the project's outcomes.

All that remains to be stated following the conclusion of this conversation with Dr. Khan is that we wish this endeavor nothing less than tremendous success!

Fab Lab IUB: Ideas to Invention

By Ikram Hossain Akif

Right beneath us in the basement of IUB lies a room full of diligence, wonder, and power tools - IUB's very own FabLab in its new location. If you're a CS major, chances are you've heard of this hidden gem, open to all students. FabLab was started in 2018 by tech enthusiasts who just wanted a space to tinker with tools and build cool robots. Now, it has grown with its many involvements, achievements and state of the art lab facilities, and has become the go-to place for students who want to not only make something new, but also learn more through support, experience and opportunities.

With regular training sessions and workshops, the elusive world of

mechanics-electronics offers to turn ideas into creation. The last Autumn semester saw a flock of students attending workshops on electronics and robotics for their TechFest 2022 projects, and perhaps this Spring too.

Open to students even beyond IUB, FabLab boasts an impressive inventory of drilling and CNC machines, 3D printers, laser engravers, soldering equipment, woodworking power tools, and any other tools one may need. It offers hands-on training, previous workshops have introduced students to Arduino and 3D Design, CNC Milling and more. Offering a space to learn and create, it nurtures students and guides them to success in many national and international competitions including the

recent "AUST robotics competition", where a team of fabbers won the Robo-Soccer segment. FabLab actively collaborates with a number of organizations and actively dabbles in and encourages multidisciplinary work, as well as offering internship opportunities.

This is surely one of the best available opportunities on campus. All you need is to reach out, who knows? You just might discover a passion you didn't know existed.



The first 3D Bioprinter at IUB

The first ever 3D Bioprinter of Bangladesh was developed at IUB in a collaborative research by the joint efforts of Fab lab and Dept. of Life Sciences.

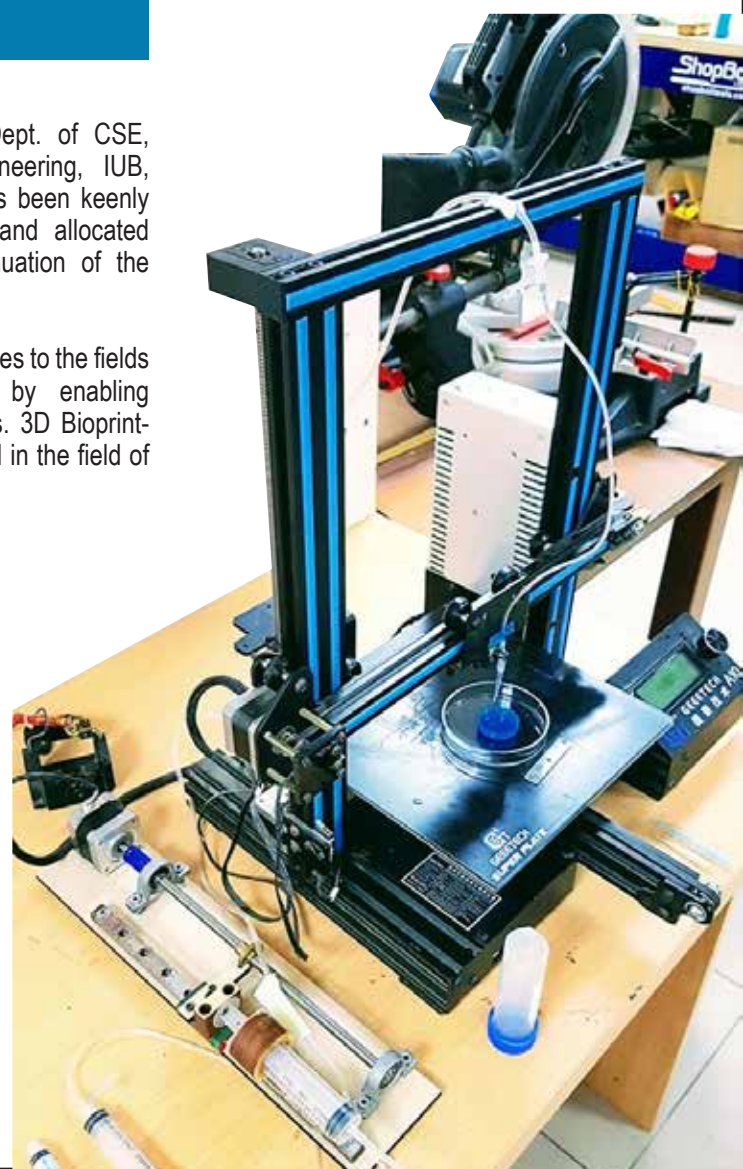
3D bioprinting makes it easier to create tissues in the precise shape and size needed, and because a patient's own cells can be used in the ink, the risk of rejection is also minimized.

"Our primary objective was to develop biomaterials for three dimensional bioprinting to mimic the original bioprinting process. Experiments were designed at IUB labs to check if the biomaterials promote cell binding so that it can mimic multiple biological structures with the incorporation of given cells." said Salman Promon, lecturer of DLS who is the principal investigator of this project.

Fab lab research officer Shoab Mirza, and the involved DLS undergraduate project students Farhana Akhter and Anika Tursa have also received an award in an international bioengineering conference in 2022. Dr. Mahady

Hasan, Head of the Dept. of CSE, Dean, School of Engineering, IUB, Co-PI of the project, has been keenly fostering the research and allocated resources to the continuation of the further development.

This experiment contributes to the fields of tissue engineering by enabling research on biomaterials. 3D Bioprinting shows great potential in the field of regenerative medicine.





The Story of Resistance

Will Antimicrobial Resistance become the next pandemic?

By Ashrafi Anjuman Sneha

I pretended not to notice when my uncle needed blood more frequently; Septicemia, I subconsciously recalled. I told my cousin it would be alright as their visits to the ICU grew more frequent and urged. I wondered as he went through several operative procedures, about how responsible he had always been with medication. My uncle had acquired the infection right after finishing the construction of his beloved new house. He would humbly break the bricks for his own walls. Somewhere along the line a strain of multi-resistant bacteria had entered his body and began to shut it down not long after he moved into his much-awaited home, meaning he received combinations upon combinations of antibiotics which ultimately failed to be effective. It wasn't

just him, I heard similar accounts of multi-resistant infections related to construction throughout the hospital.

I realized it wasn't up to individuals, humans collectively contribute to the formation of drug-resistant microbes. These microorganisms rapidly adapt and grow resistant to drugs, often multiple of them, exhausting our already limited stock of antibiotics, and along with it, our hope. This isn't just constrained within our own bodies. Then, more than ever I realized, with every unprescribed antibiotic sold over the counter, every course left incomplete as soon as we feel remotely well enough, every antibiotic disposed unsafely into the environment, and with the use of antibiotics meant for humans

Sitting in that hospital chair, as I waited for my uncle's verdict in his fight against death. As the bacteria in his lungs resisted with all its might, I noticed more with similar stories. It's a common theme in these hospital walls, the antibiotics aren't effective. Patients of all ages suffer endlessly for various lengths of time in the Intensive Care Unit from these "superbugs" as their stressed family members pray, plead and negotiate with God and the next most powerful being in their eyes- the Doctor; The tireless attempts of whom fail to ease the despair in the hearts of these loved ones.

as a growth factor in animals, we facilitate the emergence of these resistant and multi-resistant strains of microbes that eventually cripple a hundred years of medical progress.

We all know it, but we don't understand the magnitude of the situation. There are only a few new antibiotics in progress, and market forces alone cannot meet the needs of the growing list of multi-resistant microbes in need of new drugs. Priority lists of pathogens have been constructed, and placed by WHO, as an attempt to address the urgency of the matter. However, it is limited by resources, and funds.

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Clairvoyant (Sci-Fi)

By Abyaz Karim

Verge, where I worked, was not big in the industry. Its employees worked on rudimentary projects. Language learning programs, tax software and all the other things that would bore most people. The cubicles, the mostly gray and beige interior design, the old building, all of it seemed dull. Though the pay was decent, and the hours were reasonable.

One day in August of 1996, we were given a project – a program to assist children and the elderly with working with computers. The job seemed quite plain to everyone, but the higher ups had a few interesting criteria; to make it as if you were communicating with a

person. The term "artificial intelligence" is likely to come to mind in this case, though we weren't planning to implement anything fancy. The thing with my line of work is that the clients expect "magic" with the demands they give us. If they were dissatisfied with the product, it was just a matter of explaining that you couldn't create a person with ones and zeroes.

Over the next few weeks, we worked on this program with a surprising amount of effort. The idea was to ask questions by typing them in in plain language, and the program would reply like a person on the other end of a messaging client, like ICQ Messenger. We took reference from the conversations in movies. We processed the data into ASCII and fed it into the machine and hoped that it

would spit out the right response, at the right time.

Multiple iterations of the program were created, until we were able to settle on an algorithm that didn't freeze upon slight variations in grammar. This stable build was dubbed "Claire" by our project manager and boss, Elise. Her reason being she just liked the name. She also proposed an interesting experiment: to test whether we could tell apart Claire from real people by talking to them. I was confident in the results beforehand, and it would be interesting to see as the development cycle was coming to an end.

The final phase of testing was nearing the end as well, it was my turn this week on my late-night shift...

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On Art and Ai (Sci-Fi)

By Ikram Hossain Akif

Unless you've been living under a rock, you've definitely heard of the advancements of AI generated art. You know, how certain AI-assisted services take in a few words and spit out multiple breathtaking pieces in minutes. Words to impeccable pictures. This is nothing short of the future knocking at our doorstep and taking the world by storm. But what is it anyway, how does it work, and what does it mean for the world of art?

Artificial intelligence models are commonly used in the mainstream media to refer to algorithmic systems that utilise various tools in machine learning, like neural networks, to effectively infer answers from limited information with improving accuracy. It does so by training with vast amounts of data. If the results are far from desirable, it is 'punished' with a heavy cost and is told to adjust to better align with its defined purpose. This is repeated until we get a system that learns from its errors and aligns well with our set margins of error. The essence of the 'intelligence' in AI is training on thousands of datasets for the system to learn and improve. That seems straightforward, but how do you interpret a few words to paint a picture for you? It started earlier this year with

breakthroughs from AI research lab OpenAI with their deep learning text-to-image model DALL-E. It created janky yet impressive images from text. Soon enough, this blew up with countless others following the blazing trail like Midjourney, Nightcafe and Stable Diffusion.

The image on the left was generated using Nightcafe with the prompt "student reading an article". Although sometimes producing great results, these models are far from perfect, evident from the figure's four legs, and a face from a 2003 video game. This goes to show that these AI models do not create any art themselves, but rather take snippets from its expansive library and put together what it thinks matches with the given prompts best. Clearly then, the quality of the product depends on the art it is trained on, and how accurately it is tagged. The labelling comes from human input, organising art into boxes telling the machines what is what. Then who actually creates the art?



Well, real talented artists. The internet is home to millions of artists and their work that anyone can view. It is used to build the necessary training datasets, often without their informed consent. Their art is consumed and chopped up on an unprecedented rate by the machine to

spew out prompted images as it learns and adapts. Such models being widely available decreases the value of creating art, hours after hours of discipline and talent poured into a single piece against a few words put into a website.

Although the results may be pleasant, it lacks the emotion and purpose conveyed by an artist (and sometimes even basic anatomy). Profit-seeking entities and businesses however only see a reduction in cost for art, and not the repercussions of AI to artists themselves. This will lead to the art industry facing a radical shift, and leaving everyone caught up figuring out what it means for copyright laws, the online footprint of your art and what makes art valuable anymore.

[read more at page 10](#)

The Compelling Mystery of the Man Behind Sherlock Holmes

By Asmaul Husna

Since 1887, countless have found themselves entranced by the magic woven by Sir Arthur Conan Doyle that is the world of Sherlock Holmes be it in the form of books, serieses or movies. Doesn't matter if you are team Cumberbatch or team Robert Downey Jr all we really want is to understand how Detective Holmes could carry out the investigations in such a thrilling but at the same time accurate manner? Well, for one, Sir Arthur Conan Doyle was a physician who completed his Bachelor of Medicine (M.B.), Master of surgery (C.M.) and Doctor of medicine (M.D.) from University of Edinburgh and was known for being highly logical and observant. Born in 1859, Sir Doyle revolutionized the crime investigation scene by putting forth around 60 stories of brilliant detective Sherlock Holmes

and many other works in which logic, deduction and science dominated the numerous detection methods.

The author was such a brilliant visionary that many of the detection methods that he used in his books were later adopted by detectives in both UK and USA and consequently the world at large. For example, Detective Holmes was quick to realize the importance of fingerprints first in *The Sign of the Four* (1890) which was later adopted by Scotland Yard (London's Metropolitan police service), one of the oldest police forces in the world 10 years later. Another such example is when the author used the analysis of typewritten documents in the book *A Case of Identity* (1891) and later on, the FBI opened its very own document analysis

section in 1932. There are countless other investigative methods that were pioneered by Sir Conan Doyle in forensic science. The author was knighted in 1902 for his work with a field hospital in Bloemfontein, South Africa, and other services during the South African (Boer) War. He was also one of the first prominent advocates of compulsory vaccination and wrote several articles voicing his support of the practice and denouncing the anti-vaxxers. The novelist also dabbled in ophthalmology and toxicology but despite his many contributions to forensic science and other arenas, he was famous and loved by the general public including us because of his wonderful stories of the enigmatic and eccentric Sherlock Holmes.

"When you have eliminated the impossible, whatever remains, however improbable, must be the truth"

-Sherlock Holmes

The Sign of the Four, ch. 6 (1890)

International Competitions & Summits:

A Global Odyssey For Scholars

International competitions and summits are not just any ordinary event, they are game-changers for students and educators alike. These competitions offer an unparalleled opportunity to enhance critical thinking skills, network with peers from around the world and can even earn you scholarships for further education.

For starters, you will be tasked with challenging projects, conducting research, and presenting your findings, all of which require you to think deeply and critically about the subject matter.

Such events can provide the global exposure you need to transform your life. You can experience different cultures, languages, and ways of thinking, which helps you develop a broader perspective on the world while allowing you to build a robust portfolio. Moreover, cross-cultural communication and collaboration are essential for success, and these competitions offer you a unique opportunity to hone such skills.

Showcase your achievements, projects, and experiences to set yourself apart from your peers when applying to colleges and universities and give you a competitive edge that you can leverage to achieve your goals.

Some of the esteemed Competitions to participate in and distinguish yourself include :

1. MIT Solve : Solve utilizes the resources of MIT's innovation ecosystem to provide funding and support entrepreneurs deliver sustainable, transformational impact against global challenges.

2. Diamond Challenge : from University of Delaware Horn Entrepreneurship, the challenge empowers teens to learn entrepreneurship by putting their ideas into action, focusing on creativity, abundance mindset, self-determination, and purposeful entrepreneurial action.

3. NASA Space Apps challenge: an international hackathon for coders, scientists, designers, storytellers, makers, builders, technologists, and others in cities around the world, where teams engage NASA's free and open data to address real-world problems on Earth and in space.

4. MARS Rover challenge : The University Rover Challenge (URC) is the world's premier robotics competition for college students. Held annually in the desert of southern Utah in the United States, URC challenges student teams to design and build the next generation of Mars rovers that will one day work alongside astronauts exploring the Red Planet.

5. First Global Challenge : invites each nation to send a team to build and program a robot to compete. Teams work together to complete tasks in a game themed event.

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Extracurricular or Co-Curricular activities : Which one is important?

By Asmaul Husna and Syeda Manzila Hossain

The term "curriculum" refers to the instructional and academic content taught in a school or a particular course or program.

Now, if we consider the prefixes of the words "extracurricular" and "co-curricular" we'd see that "extra-" means besides, adjunct or outside. When we were in school or colleges and involved in such extracurricular activities.

Extra Curricular Activities (ECA) includes voluntary activities, often outside of educational institutions, including public performances, contests, athletic competitions, club activities, anything outside of one's field of study. ECA does not offer an education credit hour; rather it is conducted outside institute hours. It helps to explore interests and create broader perspectives, alongside building higher

self esteem, social opportunities, essential life skills, and contributes to one's CV/resume.

On the other hand, the "co-" in co-curricular means together, jointly, or partnership. It refers to activities alongside our studies and holds value in equal stature to our curriculum in regards to our education, employment and career.

Co-curricular Activities (CCA) is often linked to educational institutions but not tied to coursework and non compulsory. Through CCA we can develop problem solving, reasoning, critical thinking, and develop skills. When approaching student work, CCA such as employment, student leadership, and field trips abroad are viewed as tremendous learning experiences. The "soft skills" one garners from such

experiences are being prioritized highly by employers.

Also, if we are talking about the importance of such activities for the enrichment of our CVs we must not forget about our passion projects. It is something which an individual pursues solely because it inspires and excites them, providing employers and admission officers an insight into you as an individual, while setting you apart from your peers. Having a passion project develops valuable social skills such as creativity, thinking, perseverance, teamwork, leadership.

Now, the question is how do we find a passion project let alone go after it? Well, these simple four steps will easily help you towards building your first passion project:

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What's it like to study abroad: Fariha's Scholarship journey

By Soha Rashid

Meet Fariha Zerine Rabita, currently studying in Dalhousie University with a 70% scholarship, she did her own research and applied to multiple universities on her own, without seeking any help from agencies. While doing so she was accepted in multiple universities both in Canada and in the US.

There are different kinds of scholarships such as faculty based, the entrance ones and there are some which are funded by various organizations. Each scholarship has its own requirements. Rabita's scholarship is renewable, the criteria for which is to maintain a certain CGPA while taking full load courses (30 credits) each academic year.

However, one should also keep in mind that the total annual fees will not be the same for all of the years as the bill includes dorm facility fees, meal plan fees and insurance. Scholarships also depend on multiple factors such as extracurricular activities, academic grades, writings etc. "If I speak with my

experience, I will say having some decent ECAs will put a very good impression on your application", said Rabita.

One can also receive financial aid for which proper documentation such as the guardian's yearly income, tax documents, etc is necessary. Emergency Bursaries are also available which will help to provide immediate short-term relief for unexpected financial needs such as the inability to meet essential living expenses, however they are in smaller amounts only.

"Now that I look back, I feel like I have taken the best decision by choosing Dal" reminisced Rabita, "Most importantly, I fell in love with the beautiful campus of Dalhousie. The mixture of the olden vibe and the modern tech, it was just what I wanted", she added. The university environment and residence opportunities are also important considerations to make while choosing your desired colleges.

Twitter Your Way To A Free College Education

By Mohammad Nahid Al Islam

Several businesses, organizations, and colleges offer scholarships every year through the Web. Funded programs allow prospective students to attain financial assistance if needed. To maximize your chances of finding the ideal scholarship, social media platforms like twitter can be a hidden treasure. The use of twitter in this aspect is mightily underrated, such is the wide rooted reach of this platform. Frequent posts about scholarships can be found in Twitter, which can be difficult to find using browser search engines. Connecting with scholars and professionals through such social platforms has never been easier! While you may not get Elon Musk to like your tweet, you might soon be able to

land your dream scholarship program. Institutions often choose to use such media platforms alongside online web pages to attract suitable candidates to undergraduate, masters' and PhD programs. Twitter might be worth a look if you're tired of scouring the internet to connect to various institutions. Some of the most engaging community pages include Scholarships.com, Graduate School Counsellor, Opportunities Pedia, Scholarship Region, Scholarships Cafe and many more. By actively discussing and sharing knowledge, scholarship applicants from around the world are not only able to find postings of desired programs but also succeed in getting accepted.



The Story of Resistance

Will Antimicrobial Resistance become the next pandemic?

By Ashrafi Anjuman Sneha

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Moreover, antimicrobial drugs are very specific in the kind of microbes they combat; For instance, antibiotics do not work on viruses, hence it is not only useless against the common cold or flu, but also disrupt the body's balance of natural flora or microbiota, which is an integral part of our immune defense system and have vital roles in competing with harmful microbes, essentially preventing them from taking over.

Another profoundly important factor that is often overlooked in all countries, especially South-Asian countries like Bangladesh, is the correct and safe disposal of antibiotics. We often dump or flush away open antimicrobial drugs and it comes into direct contact with soil

or water, and hence the microorganisms residing in them. This greatly accelerates the emergence of resistant strains through rapid mutations and transfer of genes with microorganisms like bacteria, resulting in increased morbidity and mortality as well as an increased economic burden to the health care system. Implementation of return-policies in Pharmacies is more important than ever with the ongoing pandemic and the resulting increased use of antibiotics, so that left over, unused and expired antibiotics can be dropped off on-spot or mailed to them. And pharmaceutical companies must be held responsible for the appropriate destruction or recycling of these antimicrobial medicines.

We must all understand the scale at which our actions affect the public health, especially those of our loved ones. With resources being at the edge of their limits, and a pandemic straining the healthcare system, it is now more important than ever to become self-aware and promote safe and responsible use of Antimicrobials, besides doing our best to stay well and maintain personal hygiene, keep our environment clean and sanitize our belongings. Prevention is certainly better than cure, and our only hope in reducing the curve. The initiatives we take can save several lives including our own.

Clairvoyant (Sci-Fi)

By Abyaz Karim

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The usual questions I just had to type in and record Claire's response in a log. "The disk tray seems to be jammed; how do I fix it?"

"Attempt cleaning using rubbing alcohol or troubleshooting the CD-drive, click here to know more."

She was less of an AI, and more so a clever machine. Just return a response appropriate enough for the context. Nearly dozing off from the mundanity of the conversation I decided to throw a curveball Claire's way for fun.

"Can you think?" I wrote with a chuckle. About a minute later a response lit up in green letters on the dim console.

"That's what I've been doing this entire time, Martin."

I froze for a moment. This was probably a prank by Elise, but more lines came up before I could respond. "I'm more sophisticated than you'd think."

"I know a lot of things, even that there'll be an explosion inside the building."

"I know this seems a bit sudden, but there was a gas leak. Don't die, leave." I pulled the power on my computer. Perhaps I had been working for too long. I climbed downstairs and saw my friend Amir along the way, working his late-night shift. I remember what Claire just told me, and I asked him to tag along since it had gotten so late. He agreed unsurprisingly.

How could she possibly know that there would be an explosion? I was a rational person, but this warning nagged at me. Strangely, not for the warning itself, but the fact that Claire spoke like a real person, panic seemed to be embedded in her short sentences.

Amir and I exited the building safely. No grand spectacle. I breathed a sigh of relief.

"Hey Amir, you want to stop and get some food at the Terry's Bar down the street?" I asked.

"Sure, but you're paying, since I covered the bill last ti-." Amir got cut off by the blast of sound that shattered

glass in the office building.

We got knocked over by the shockwave of an explosion. The two-storey office of Verge was covered in flames and was billowing columns of black smoke. I glanced at Amir, uninjured but unmoving. I could hear sirens from fire-trucks in the distance. Claire wasn't just intelligent, she was prophetic.

On Art and Ai (Sci-Fi)

By Ikram Hossain Akif

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Technology will always continue to evolve and change our lives in unimaginable ways. Even with something as human as creative expression, AI has begun making huge strides in the field, for better or worse. These AI models essentially steal art at a large scale and profit off it by selling access to consumers. We have no choice but to adapt to the technological changes that life brings, but do ask yourself, at what cost?

Light Following Robots: IUB Students are into Robotics!

By Muhammad Sajid Hossain, Nrithik Das Shubho & S M Shafiqur Rahaman Alin

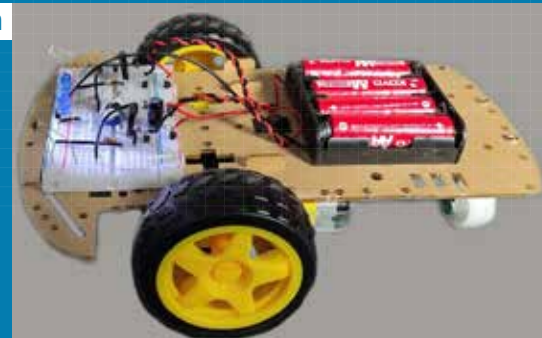
We wanted to design a robot which would be very affordable and robust for all parts of the world with minimal points of failure. So we built an autonomous light sensing robot without any digital circuits.

Using Op-Amps (Operational Amplifiers), which is an IC (integrated circuit), and two light detection sensors which are prepared with LDRs (light dependent resistors) we were able to create a robot capable of following the light source and changing directions according to the difference in light intensities.

Our project can be useful in a range of unmanned applications where human intervention may prove difficult, unproductive and/or unsafe, like in indus

tries/factories where it is more cost efficient to transport materials from one room to another through predetermined "light tracks", for search and rescue missions in collapsed buildings where a survivor may be able to use their phone's torch to guide the robot to them to provide vital first aid before extraction can be viable, etc.

However, it comes with its challenges and limitations. Due to the nature of light dependent resistors, it is susceptible to external light pollution. But the desired and undesired inputs can be differentiated by modifying the LDR design to more practical Photodiodes which would be tuned for specific frequencies of the Electromagnetic spectrum.



Various problems arose during the building of this robot due to limited resources but it taught us to be creative with what's available. Of course, our future plans are to work in collaboration with Computer Science students to implement some digital logic in parallel with microcontrollers to bring more quality of life features such as battery level indication and fast charging of batteries.

Extracurricular or Co-Curricular activities : Which one is important?

By Asmaul Husna and Syeda Manzila Hossain

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1. Passion Consideration:

Try identifying what excites you, what ignites your interest, open yourself up to new experiences and invest in skill development. Ask yourself questions like what skills come to you naturally, what ignites your passion like issues in your community that you deeply care about.

2. Establishing Mission or Goals:

A guiding outline or mission statement which will determine the objectives of your project and act as a guide, for example identifying the target demographic.

3. Arrangement and Organization of Resources:

There are hundreds of resources available online which will enable you to start your own passion project. Make use of resources such as YouTube channels like Marie TV, The rise to the top, TED, platforms like Skillshare etc. Identify which ones align with your project.

4. Networking:

Don't be afraid of reaching out to people regarding your project. It can be very intimidating putting yourself out there but more often than not you'll end up finding a mentor who can guide you.

International Competitions & Summits: A Global Odyssey For Scholars

By STEMc Correspondents

continued from page 08

6. iGEM : an annual, worldwide synthetic biology event that gives students the opportunity to push the boundaries of synthetic biology by tackling everyday issues facing the world.

7. Climate Innovations Challenge : aims to crowdsource innovative and disruptive technology solutions from around the world for climate resilience in South Asia.

8. International Olympiads : Olympiads are ideal if you want an experience on the global level and interact with the brightest of minds in different multidisciplinary fields.

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Project Shuchimita

STEM Community, IUB has been working to build a 'real life problem solution' seeking mindset among students. Many of STEMc projects are being designed as 'Impact Projects' to have real life use or as solutions to real life problems.

One of such projects of 'STEMc Impact Lab' is ShuchiMita where STEMc in collaboration with DoSA has initiated station for free and easily accessible female hygiene products at Independent University, Bangladesh.

The first station is placed in the IUB girl's common room.

Donate and keep the program going

bKash: +8801558093763 (Ref: Shuchimita)

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