■ OFF CAMPUS ■

From MIST to MIT:
THE JOURNEY OF AKIB ZAMAN

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Akib Zaman, an alumnus of the Military Institute of Science and Technology (MIST), is currently pursuing his PhD at the Massachusetts Institute of Technology (MIT) in the Department of Electrical Engineering and Computer Science (EECS).

Campus sat down with Akib as he shared more about his experiences, research, and insights.

Campus (C): *Could you tell us a bit about your current research?*
Akib (A): Initially, my research focused on the intersection of robotics and geometry processing, but now, I am specifically working on developing algorithms to optimise the design and control of shape-shifting robots.

I am also interested in extending this work using phase-changing materials, which could enable liquid shape-shifting robots. This technology has vast potential in robotics, especially for exploring unknown environments such as space, the deep ocean, and the human body.

C: *What were some of the most notable projects from your undergraduate years that align with your current research interests in robotics?*
A: During my first two years, I focused on strengthening my understanding of core Computer Science and Engineering (CSE) subjects like SPL, OOP, DSA, etc., without any involvement in robotics. My capstone project during my third year, "Intelli-Helmet", was a stress monitoring system for soldiers and it used EEG and heart rate data to identify post-traumatic stress disorder (PTSD). This project was inspired by a scene from the TV series Band of Brothers, and it was published as my first research paper.

Later, I worked on developing "UVC-Purge", a semi-autonomous robot designed to disinfect spaces during the COVID-19 pandemic using controlled ultraviolet-C (UVC) radiation. Our team won the championship in the "Application Category" at the Medical Robotics Challenge for Contagious Disease 2020, hosted by the UK Robotics & Autonomous Systems (UK-RAS) Network. This recognition, along with a GBP 5,000 grant, inspired me to further explore the field of robotics.

C: *What relevant initiatives did you take during your time at MIST?*
A: After winning the grant in the early part of my fourth year, my group and I had a dream of participating in the University Rover Challenge (URC), one of the most prestigious rover competitions in the world, organised by NASA's Mars Society. We presented our success with UVC Purge as proof of concept to MIST's higher authorities, and we were granted funding to pursue our vision.

With an incredible team of around 50 members, we built the Mars rover from scratch, re-forming the Mongol Barota - MIST Mars Rover Society. In that year's virtual finals, we became the top-scoring team globally and produced another publication based on the novelty of our rover.

C: *Could you please tell us how you approached the MIT application process? How did you connect with professors or research groups at MIT during that time?*
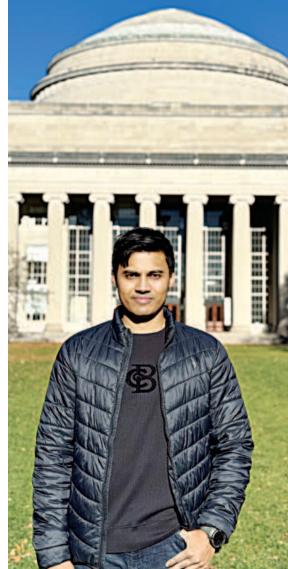

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A: I didn't apply right after graduating in 2021 because I felt my profile wasn't strong enough to get into a top-tier university where I could pursue advanced research. So, I decided to take a year or two to strengthen my research experience. During that time, I worked with a professor at Rutgers University, USA, working on a deep learning framework for developing a sleep stage classification framework, and co-authored two research papers. I also collaborated with my thesis supervisor and colleagues as a lecturer at United International University (UIU) on several research projects, which helped solidify my research portfolio. Around September 2022, I began compiling a list of professors whose research interests aligned with mine and whose labs I felt would be a good fit. I started networking with them, finding common ground before eventually reaching out to them via email. My target universities included Imperial College London and several top and mid-tier US universities based on the QS World University Rankings. In the end, I received acceptance offers related to robotics from MIT, University of Washington, University of Virginia, and University of Minnesota Twin Cities among others.

C: *What key factors should students consider when planning their graduate applications, especially for top universities like MIT?*
A: There are several key factors, the importance of which I realised even more after becoming a student reviewer for MIT applications this fall. First and foremost are CGPA and research profile. My CGPA was 3.98 on a scale of 4, and to get into top universities, you typically need a strong CGPA to demonstrate long-term dedication.

However, you can make up for a lower CGPA with significant research experience, particularly if you've published your work in well-known conferences or journals. It's crucial to have projects and publications in the same domain as your intended programme. In my application, I was able to connect the dots clearly, showing an intermediate level of expertise through hands-on projects like those in the rover challenges, along with a few publications in conferences and journals. All of this showcased my passion for solving complex problems, particularly in robotics.

Next, comes the standardised tests. I didn't take the GRE since MIT waived it during my application year, but I did take the IELTS and scored a Band 8, with all sections higher than 7.5. For those preparing, I recommend taking mock tests to ensure readiness and aiming for balanced scores across all sections.

Moreover, start building your CV and academic profile early, keeping them concise and organised. Your statement of purpose (SOP) and letters of recommendation (LoRs) are vital for piecing together your profile. They present your unique story and align your research interests with the programme. Engaging in projects with faculty members and maintaining strong relationships with them will help you organically identify the right people to write strong LoRs, which are absolutely crucial.

Lastly, extracurricular activities (ECAs) round out your application, showing versatility. I had a moderate ECA profile, working as a lecturer and being a founder of several teams that secured over USD 200,000 in funding, which demonstrated my commitment to STEM and community service.

Reaching out to professors is also a key part of the process. I had interviews with professors from five of the nine universities I applied to before the application deadlines, thanks to targeted outreach.

C: *As an MIT PhD student and a MIST alumnus, what advice would you give to aspiring international students in Bangladesh?*
A: My favorite quote from the movie *Turbo* is, "No dream is too big, and no dreamer is too small." Keep your dream alive by working hard and nurturing your inner inquisitive spirit along the way. I believe the fear of failure is the biggest enemy when it comes to taking risks in such a competitive academic environment in Bangladesh. I would encourage people to still take risks and follow their passion wholeheartedly. Not every voyage will lead to success, but each journey will teach you valuable lessons. And one day, you might look back and smile, realising that every step was necessary for the dots to connect perfectly.

Fatima Ashraf is a Campus Ambassador for The Daily Star from MIST.