

CHOWDHURY AHMED HOSSAIN

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Education

Bangladesh University of Engineering and Technology (BUET)

Bachelor of Science in Mechanical Engineering

CGPA: 3.48 out of 4.00

Dhaka, Bangladesh

Apr. 2019 – July 2024

Relevant Coursework

- | | | |
|-------------------------|------------------------------------|------------------------|
| • Composite Materials | • Metallic Materials | • Numerical Analysis |
| • Bioengineering | • Mechanics of Machineries | • Mechanical Design |
| • Engineering Mechanics | • Electro Mechanical System Design | • Production Processes |
| • Mechanics of Solids | • Heat Transfer Equipment Design | • Machine Tools |

Test Scores

Graduate Record Exam (GRE)

September 2024

Overall Score 331/340 | Quantitative Reasoning 168/170 | Verbal Reasoning 163/170 | AWA 3.5/6

Research Interest

- | | | | |
|----------------------|--------------------------|--------------------------|---------------------------|
| • Material Behavior | • Bio-inspired Materials | • Additive Manufacturing | • Computational Mechanics |
| • Fracture Mechanics | • Composite Materials | • Machine Learning | • Mechanical modelling |

Research Experience

Undergrad Thesis

July 2023 – July 2024

Thesis title: *Atomistic Investigation of Crack Propagation and Parameterization of Cohesive Traction-Separation of Single Crystal Cobalt-Titanium Alloy*

Supervisor: Dr. Jane Alam Khan, Assistant Professor, ME, BUET

- Investigated crack propagation in B2 phase Cobalt-Titanium alloy using molecular dynamics simulations.
- Analyzed stress developments and lattice structure evolution during crack propagation at different temperatures.
- Developed temperature-dependent traction-separation curves through python scripting for cohesive zone modeling

University Funded Project (Collaboration)

Nov. 2023 – Present

Project title: *Comprehensive performance analysis of prototype and computer-designed horizontal axis hydrokinetic turbine.*

Funded by: Research and Innovation Center for Science and Technology (RISE), BUET

The research compares the output power of a hydrokinetic turbine with two different airfoil sections using computer simulations and practical experiments, involving BEM algorithm for blade design, CFD simulations, and experimental testing with a physical model. My contributions were:

- Designing the experimental arrangements in 3D CAD for testing the hydrokinetic turbines
- Manufacturing the experimental setup using traditional methods and **3d printing** and conducting the necessary experiments.

Technical Skills

Simulation Software: LAMMPS, Abaqus CAE, Ansys Mechanical

CAD Software: SolidWorks (CSWP), AutoCAD, Fusion 360

Programming Languages: Python, Matlab, C

Hardware Skills: 3d printing, Product design and manufacturing, Microcontroller (Arduino)

Miscellaneous Tools: Microsoft office (Word, Excel, Powerpoint), L^AT_EX, Zotero, Techplot, Matplotlib

Selected Projects

Mechanized Gaussian Cannon with Head-Track Targeting System

June 2022 – August 2022

Electromechanical System Design Coursework

- Improved and developed multiple functional and synchronous mechanisms to mechanically and sequentially shoot, reload and reset a Gaussian cannon.
- Built a head-mounted tracking system consisting of an accelerometer, Arduino microcontroller and wireless RF modules to control a 2-DOF arm that imitates the user's head movement.

Ear Pressure Wave Monitoring Device (In Progress)

August 2024 – present

Biomedical Product Design Project

- Designed a device that can predict potential health issues by monitoring pressure variations in tympanic membrane.
- Building a functioning prototype, conducting a medical trial and potentially proceeding to mass producing.

Biometric Door Lock

July 2023

Consumer Product Design Project

- Designed a dual mode door lock that combined manual cylinder lock with fingerprint recognition utilizing a novel mechanism.
- Successfully fabricated a 3D printed prototype and verified its flawless functionality.

Child-Safe Oven Door Lock

May 2023

Consumer Product Design Project (Design Competition)

- Designed and optimized a mechanical lock to prevent children from opening an oven door without adult supervision.
- Built 3D printed prototypes to test for functionality, durability, ease of assembly and use.
- Recognized as the top designer among 62 participants.

Double Pipe Heat Exchanger

November 2022 – February 2023

Heat Transfer Equipment Design Coursework

- Calculated necessary design parameters for the intended use case.
- Built and assembled the double pipe exchanger utilizing machine shop facilities.
- Tested the heat exchanger to ensure that heat and pressure requirements are met.

Startup Experience

Protodesk

Jan. 2023 – Feb. 2024

Product Design and 3D Printing Services

Dhaka, Bangladesh

- Applied mechanical engineering and product designing principles to develop and prototype end-user products that are user-friendly, cost-effective, and easy to manufacture
- Managed fabrication of over 60 electromechanical and architectural projects utilizing 3d printing.

Technical Experience

Mechanical Engineering Intern

Nov. 2023

BSRM Steels Ltd

Chittagong, Bangladesh

- Gained in-depth knowledge about steel re-rolling process utilizing cutting edge technologies.
- Experienced various industrial systems such as Induction Furnace, WTP, overhead cranes, and power supply.
- Learned about industry practices such as TPM, quality control, and inventory management.

Leader, Brake and Vehicle Safety Sub-team

Jan. 2023 – July 2024

AutoMaestro (Formula Student Team)

- Designed and optimized the braking system utilizing CAD & CAE.
- Initiated manufacturing and testing of the braking system.

Head of Project and Competition

July. 2022 – July 2024

BUET Robotics Society

- Organized and instructed several workshops on robotics.
- Organized national level inter-university robotics competitions including Robo Carnival 2023 and 2024

Achievements and Certifications

1st Runners-up, CADQuest (Intra BUET CAD Competition) <i>BUET Automobile Club</i>	<i>July 2023</i>
Certified SolidWorks Professional (CSWP) – Mechanical Design <i>Dassault Systèmes</i>	<i>Feb. 2023</i>
Champion, Poster Presentation Competition) <i>NAME Week 2024</i>	<i>Feb. 2024</i>

Referencess

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