

SHUVAGATA NATH SOUMMA

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Education

Bangladesh University of Engineering and Technology (BUET)

Bachelor of Science in Mechanical Engineering

CGPA: 3.32/4.00

Dhaka, Bangladesh

Apr. 2019 – Jul. 2024

Test Scores

IELTS Academic

Sep. 2025

Overall Score 8/9 | Listening 8.5/9 | Reading 7.5/9 | Writing: 7.5/9 | Speaking 7.5/9

Research Interests

- Additive Manufacturing
- Material Design
- Fracture Mechanics
- Numerical Modelling
- Material Behavior
- Bio-inspired Materials
- Computational Mechanics
- Machine Learning

Research Experience

Undergraduate Thesis

Jul. 2023 – Jul. 2024

A Study of Enhancing Thermal Comfort and Development of an Intelligent Efficient Cooling System for Parked Car Interiors

Supervisor: Dr. Md. Ehsan, Professor, Dept. of Mechanical Engineering, BUET

- Investigated transient thermal behavior in parked vehicle cabins through controlled experiments, identifying key parameters driving cabin temperature rise to 50–52 °C.
- Developed and validated a computational fluid dynamics (CFD) model based on CAD geometry to analyze solar heat gain and optimize airflow, achieving a 15–18 °C reduction in cabin temperature.
- Designed a low-cost microcontroller-based automated cooling system with 12 V power input to enhance passenger comfort.

Publications

1. U. W. Tabassum, **S. N. Soumma**, A. Sengupta, and T. Tabassumut, “Design and Fabrication of a Cost-Effective, Refreshable Mechanical Braille Display for Visually Impaired Students in Bangladesh,” *Proceedings of the 14th International Conference on Mechanical Engineering (ICME)*, 2023.
2. S. T. Ahmed, **S. N. Soumma**, M. Ehsan, and C. R. Shaishab, “A Study of Enhancing Thermal Comfort and Development of an Intelligent Efficient Cooling System for Parked Car Interiors,” *Proceedings of the 9th BSME International Conference on Thermal Engineering (ICTE)*, 2024.

Selected Projects

Braille-X: Refreshable Mechanical Braille Display

Apr. 2022 – Aug. 2022

Electromechanical System Design Coursework

- Designed and fabricated multi-component PLA parts using FDM 3D printing for a cost-effective Braille display.
- Developed text-to-Braille algorithms for accurate character rendering.
- Engineered a lead-screw-driven linear motion system with stepper motors for smooth sequential Braille output.

SmartAQI – Machine Learning Based Air Quality Prediction

Jun. 2021 – Nov. 2021

Computer Programming Language Coursework

- Developed a Random Forest regression model for Dhaka’s AQI prediction.
- Performed data preprocessing, train-test split, and model evaluation (MAE, R^2).
- Analyzed feature importance and created an interactive real-time prediction tool.

FSAE Standard Vehicle Chassis

Jun. 2022 – Aug. 2022

Formula Student Competition

- Optimized a spaceframe chassis across 34 design iterations and 500+ simulations, maximizing safety factor while minimizing weight.
- Selected BS1387 steel for optimal strength-to-weight ratio; fabricated chassis using CAD drawings, jigs, and precision welding.

Renaissance V1.0: Mars Rover

Apr. 2022 – Oct. 2022

University Rover Challenge

- Designed and fabricated a truss-based rover structure with optimized triangulation.
- Manufactured rover arm components (base plate, bearing holder) via sheet metal laser cutting.

Gasketed Plate Heat Exchanger

Nov. 2022 – Feb. 2023

Heat Transfer Equipment Design Coursework

- Built a 9-plate exchanger using aluminum, rubber gaskets, and steel endplates.
- Assembled and tested prototype; confirmed leak-free operation up to 15 kPa.

Topology Optimization and Fabrication of a Formula Student Bell Crank

Sep. 2023 – Mar. 2024

Formula Student Competition

- Performed topology optimization in ANSYS to achieve weight reduction while maintaining stiffness.
- Conducted FEA under braking and cornering loads to validate factor of safety and fatigue life.
- Fabricated the optimized bell crank via CNC machining using Mild Steel (MS)

Technical Skills

Simulation: ANSYS Fluent, ANSYS Structural

CAD: SolidWorks, AutoCAD, Fusion 360

Programming: Python, MATLAB, C

ML-Framework: Scikit-learn

Thermal Design Tools: HTRI Xchanger Suite 6.0, 3E Plus

Documentation & Presentation: Office Suite, LaTeX, Tecplot 360, Matplotlib, NumPy

Industry Experience

Assistant Manager – Product Quality

Sep. 2024 – Present

A.O. Smith Corporation

- Worked on injection and blow molding of engineering polymers such as ABS, HIPS, GPPS, PPCP, optimizing mold design and process parameters to enhance field performance.
- Improved valve reliability by replacing silicone with EPDM in solenoid diaphragms after root cause analysis.
- Reduced assembly defects by 40% through refined mold design and introduced post-molding air cleaning, enhancing sealing performance in final assemblies.

Research & Development Engineer

Jun. 2023 – Oct. 2023

Spectrum Engineering Consortium (Pvt.) Ltd.

- Designed robotic subsystems including a rover elbow with integrated linear actuator in SolidWorks.
- Conducted structural and stability analyses using ANSYS and analytical calculations.
- Manufactured rover components via CNC machining, validating design through prototyping.

Affiliations

Team Leader, AUTOMAESTRO: Formula Student Team of BUET

Nov. 2022 – Jul. 2024

Led a 40-member team in Formula Student competitions; coordinated with BITAC for CNC machining, supervised fabrication of chassis and components, and managed sourcing of engines and suspension from abroad.

Vice President, BUET Automobile Club

May. 2023 – Jul. 2024

Organized BUET AutoFest and technical workshops; instructed students on CAD modeling and FEA fundamentals to build design and analysis skills.

Event Organizer, Mechanical Engineering Association (MEA) & IMechE, BUET

Apr. 2019 – Jul. 2024

Planned and executed departmental seminars, career talks, and design competitions with national and international speakers.

Class Representative, Dept. of Mechanical Engineering, BUET

Apr. 2019 – Apr. 2023

Facilitated communication between faculty and students; managed academic coordination for a cohort of over 180 peers.

Mechanical Sub-Team Member, INTERPLANETER: Mars Rover Team of BUET

Apr. 2022 – Oct. 2022

Contributed to the design and fabrication of rover subsystems for University Rover Challenge, focusing on structural optimization and manufacturing support.

Achievements & Certifications

Academic Excellence Scholarship, Government of Bangladesh

Jun. 2018 – Jul. 2024

4th Place, European Rover Challenge (ERC), Poland

Sep. 2022

23rd Place, University Rover Challenge (URC), USA

Jun. 2022

11th Place, Lap Time Simulation, Formula Student UK

May. 2022

Certified SolidWorks Professional (CSWP), Mechanical Design

Jun. 2021

Champion, Creative Talent Hunt, Government of Bangladesh

Jan. 2016

1st Runner Up, BAS Physics Olympiad

Jan. 2015