

# Md Arafath Rahman Nishat

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## Objective

A dedicated fourth-year (L4-T2) Mechanical Engineering student at Bangladesh University of Engineering and Technology, I bring a solid academic background with a CGPA of 3.93. Actively pursuing internship opportunities in the domains of Robotics, Machine Learning, and Automobile, my goal is to apply theoretical knowledge to practical scenarios. Enthusiastic about contributing to innovative projects, I am eager to immerse myself in these dynamic fields, gaining valuable hands-on experience and making meaningful contributions to technological advancements.

## EDUCATION

- **Bangladesh University of Engineering and Technology (BUET)**  
*4<sup>th</sup> year student, B.Sc in Mechanical Engineering; CGPA-3.93*

## INTERESTS

- Robotics
- Control Systems
- Additive Manufacturing
- Machine Learning

## PUBLICATIONS

- **Conference Papers**
  - S. U. Rauf, S. Sakib, M. A. Hassan, S.F. Sabik, N. P. Jaman, **M. A.R. Nishat**, T. I. Tahsif, N. A. Tanisha, S. R. Sunny, K. A. Rahman “Design and Development of a Multifunctional Autonomous Rover Platform for Space Exploration, Search and Rescue, Soil Analysis and Surveillance”. Presented at the 15th International Conference on Mechanical Engineering 2025.
  - **Md. Arafath Rahman Nishat**, Anurag Dev, Aniruddho Biswas, Aion Aich “Compact Spiral Plate Heat Exchanger: A Comparison with Conventional Alternatives on Scaling and Fouling Mitigation”. Presented at the ASHRAE Winter Conference 2026.

## SCHOLARSHIPS & GRANTS

- **ASHRAE Undergraduate Program Equipment Grants**
  - Awarded the Undergraduate Program Equipment Grant of USD 260 by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) for the project titled “*Design and Development of a Sustainable Spiral Plate Heat Exchanger for Industrial and Educational Applications*” in June 2025.
- **Merit Scholarship (in six consecutive semesters)**
  - Awarded the Merit Scholarship by Bangladesh University of Engineering and Technology (BUET) in every semester for securing a position among the top merit holders in the Department of Mechanical Engineering.
- **Dean's List Scholarship (in six consecutive semesters)**
  - Awarded the Dean's List Scholarship by BUET in every semester in recognition of outstanding academic performance.

## PROJECTS

- **Prochesta v1.0 | v2.0 | v3.0 - Mars Rover**
  - Designed Science Board PCB.
  - Debugged the electrical system of the mars rover.
  - Executed the wiring assembly of the rover for optimal functionality.

- Participated in “University Rover Challenge 2023 (URC)”, “European Rover Challenge 2023 (ERC)”, & “Anatolian Rover Challenge 2023”.
- **Prottasha v1.0- A concept Mars Rover**
  - Designed full electrical system of the mars rover.
  - Participated in “International Rover Design Challenge (IRDC)”.
- **Scalable Spiral Plate Heat Exchanger**
  - Designed and developed a scalable spiral plate heat exchanger tailored for the food and beverage processing industry. The system offers high thermal efficiency and performs exceptionally well with viscous and fouling fluids, all within a compact, eco-friendly design. It uses river water as a sustainable cooling medium, maintaining safe discharge temperatures to protect aquatic ecosystems. The design also ensures easy maintenance, inspection, and cleaning, making it highly suitable for industrial applications.
- **Real-time Wheeled Robot Controller and Simulator & PID Algorithm with Odometry**
  - Designed and implemented a real-time wheeled robot controller and simulator using Wi-Fi-based duplex TCP/IP communication for wireless control and monitoring. Integrated path planning capabilities to autonomously navigate to target coordinates by calculating wheel angles and transmitting commands. Utilized a PID control algorithm for precise motor speed adjustments, ensuring accurate trajectory following. Incorporated wheel odometry using Hall effect encoders to provide real-time feedback and monitoring of robot movement. Developed a user interface allowing input of target locations and live visualization of robot performance.
- **Pneumonia Detector based on ML**
  - Developed a pneumonia detection website utilizing my custom-trained Machine Learning model with almost 5000+ samples, based on X-ray reports. Explore it at "<https://medapp-nishat.onrender.com>".
- **Flappy Bird game with reinforcement Learning**
  - Developed a "Flappy Bird" game using Python and trained an AI agent using NEAT (Neuro-evolution of augmenting Topologies) algorithm to play it autonomously, achieving unbeatable performance after just 6 generations, demonstrating the potential of reinforcement learning.
- **Vibration Analyzer and Visualizer**
  - Created a Vibration Analyzer project, excelling in predicting and preventing machinery issues. Explored diverse applications, including health metrics monitoring for holistic wellness and real-time snooze tracking for parents.
- **Rollie Pollie – A bio-inspired rolling, crawling robot**
  - Designed 'Rollie Pollie,' a bio-inspired rolling-crawling robot inspired by the *Cebrennus rechenbergi* spider. It seamlessly combines walking and rolling mechanisms for versatile terrain navigation. Enhanced with machine learning, it excels in interactive tasks and surveillance, making it ideal for remote inspections and search and rescue missions. Additionally, Rollie Pollie offers potential as a pet companion through its engaging interactive features.
- **Smart Surveillance System based on ML**
  - Developed an Image Classifier using ML to identify occupied and empty parking spaces. Integrated it into a CCTV-based Parking Lot Surveillance System, enabling accurate car counting and vacant space identification. Demonstrates practical ML application for real-world solutions.
- **Virtual Assistant with Python**
  - Developed Anisha v1.0, a Python-based Virtual Assistant proficient in recognizing human voices and engaging in vocal interactions. Capable of personalized greetings based on date and time, playing music, sending emails, searching in Wikipedia, introducing itself, opening applications, typing on a word file, providing time, date, and comprehensive weather updates for any global region. Operable through seamless voice commands.
- **Knuckle Simulation of Formula Student Car**
  - Conducted knuckle simulation and analysis for Team AutoMaestro's Formula Student car, ensuring structural integrity and performance optimization.

*Visit my portfolio website for more details.*

## EXPERTISE AND SKILLS

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- **Cad Software:** Solidworks, AutoCAD, TinkerCAD
- **Simulation Software:** Optimum K, Proteus, Simulink, Ansys Workbench, Comsol
- **AI:** Machine Learning, Deep learning
- **Programming Language:** C, C++, Python, Matlab, Arduino, ROS2.
- **Web Development:** HTML, CSS, JavaScript
- **PCB and Electrical Design:** Altium, Proteus, Solidworks Electrical
- **Micro-controller:** Arduino, Raspberry pi pico, ESP32
- **Graphics:** Illustrator, Canva
- **Other Software:** Microsoft office suit, Capcut
- **Aptitude:** Event Management, Organizing, Project management, Leadership, Critical thinking, Documentation

## AFFILIATIONS

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- **Spectrum Engineering Consortium Ltd.** || *Intern in Embedded System* July 2024 - June 2025
- **DhumketuX** || *Intern in Avionics System* September 2024 - Present
- **Bored Tunnelers** || *Electrical Engineer* September 2024 – December 2024
- **Team Interplanetar** || *Electrical & Communication Sub-team Lead* December 2022 – July 2025
- **Team Automaestro** || *Team Leader* August 2023 - Present
- **BUET Automobile Club** || *Joint Secretary* June 2023- Present
- **BUET Robotics Society** || *Vice President* June 2023 - Present
- **ASHRAE BUET Student Branch** || *Vice President* September 2024 - Present
- **IMechE BUET Student Chapter** || *Affiliate member* July 2022 - Present

## HONORS & AWARDS

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- **Innovation Cohort-I of UIHP** May 2025  
Team Position: 3<sup>rd</sup> || Role in team: Technical Lead
- **Anatolian Rover Challenge 2023** July 2023  
Team Position: 1<sup>st</sup> (Preliminary Round) || Role in team: Electrical Sub-team Member
- **European Rover Challenge 2023 (Remote edition)** September 2023  
Team Position: 13<sup>th</sup> || Role in team: Project Management Specialist
- **International Rover Design Challenge (IRDC)** May 2023  
Team Position: 15<sup>th</sup> || Role in team: Electrical Sub-team Member
- **University Rover Challenge 2023 (URC)** June 2023  
Team Position: 27<sup>th</sup> || Role in team: Electrical Sub-team Member
- **Certified Solidworks Professional- Mechanical Design** April 2024
- **Certified Solidworks Professional- Simulation** July 2024
- **4 Certified Solidworks Professional- Sheet Metal, Drawing Tools, Surfacing, Weldments** July 2024
- **Certified Solidworks Associate - Electrical** November 2023

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## CERTIFICATIONS

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- **Supervised Machine Learning: Regression and Classification** December 2023  
*Coursera*
  - **Signal Processing Onramp** November 2023  
*Mathworks*
  - **Image Processing Onramp** April 2024  
*Mathworks*
  - **Introduction to Programming with Matlab** March 2023  
*Coursera*
  - **Robotics: Aerial Robotics** April 2022  
*Coursera*
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## Reference

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Dr. Aloke Kumar Mozumdar  
Professor,  
Department of Mechanical Engineering,  
Bangladesh University of Engineering and Technology

Dr. Kazi Arafat Rahman  
Associate Professor,  
Department of Mechanical Engineering,  
Bangladesh University of Engineering and Technology