Md Arafath Rahman Nishat

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Objective

A dedicated fourth-year (L4-T1) Mechanical Engineering student at Bangladesh University of Engineering and Technology, I bring a solid academic background with a CGPA of 3.91. 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)**
  4th year student, B.Sc in Mechanical Engineering; CGPA-3.91

INTERESTS

- Robotics
- Automobile
- Machine Learning
- Mechanical Design and Simulations
- Electro-mechanical Systems
- Web Development

PROJECTS

- **Prochesta 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)”.*

- **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

- **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.
- **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

AFFLIATIONS

- **Spectrum Engineering Consortium Ltd.** July 2024 - Present
  Intern in Embedded System

- **DhumketuX** — September 2024 - Present
  Intern in Avionics System
- **Bored Tunnelers** — September 2024 – December 2024
  Electrical Engineer
- **Team Interplanetar** — December 2022 - Present
  Electrical & Communication Sub-team Lead
- **Team Automaestro** — August 2023 - Present
  Suspension Sub-team Member
- **BUET Automobile Club** — June 2023- Present
  Marketing Executive
- **BUET Robotics Society** — June 2023 - Present
  Vice President
- **IMechE BUET Student Chapter** — July 2022 - Present
  Affiliate member

HONORS & AWARDS

- **Anatolian Rover Challenge 2023** — July 2023
  Team Position: **1st** (Preliminary Round)
  Role in team: Electrical Sub-team Member
- **European Rover Challenge 2023 (Remote edition)** — September 2023
  Team Position: **13th**
  Role in team: Project Management Specialist
- **International Rover Design Challenge (IRDC)** — May 2023
  Team Position: **15th**
  Role in team: Electrical Sub-team Member
- **University Rover Challenge 2023 (URC)** — June 2023
  Team Position: **27th**
  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

CERTIFICATIONS

- **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

Reference

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