SAYBA KAMAL ORNI

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EDUCATION

- **Bangladesh University of Engineering and Technology (BUET)** Jan 2022 – Ongoing
  B.Sc. in Electrical and Electronic Engineering CGPA: 3.64 / 4.00 (7 semesters)

TEST SCORES

- **TOEFL iBT:** 112/120 (Test date: Dec 6 2025)

SKILLS

- **Software & Tools:** Experienced with PCB design tools (Altium Designer, Eagle, EasyEDA), power-system simulators (PSAF, PSS/E), circuit simulators (Proteus, PSPICE), FPGA development using Intel Quartus Prime (Verilog HDL), and embedded development with Keil µVision 4/5.
- **Languages:** Python (ML/DL), MATLAB, C, C++
- **Hardware:** Soldering, wiring, sensor interfacing on PCB
- **Embedded/MCUs:** Arduino, Raspberry Pi Pico (RP2040), STM32, ESP-01 (ESP8266)

MAJOR COURSES COMPLETED

- Artificial Intelligence and Machine Learning — 3 cr; AI & ML Laboratory — 1.5 cr
- Probability and Statistics — 3 cr; Linear Algebra — 3 cr
- Medical Imaging — 3 cr
- Digital Electronics — 3 cr; Laboratory — 1.5 cr
- Digital Signal Processing I — 3 cr; Laboratory — 1.5 cr

RESEARCH EXPERIENCE

3D Arterial Segmentation in CT Angiography

Final Year Thesis — Ongoing *Undergraduate Researcher*

Investigating patch sampling strategies to improve multi-class arterial and aortic-branch segmentation using an IRB-approved CTA dataset of 59 TBAD patients and implementing in a full pipeline.

SACE: Scale-Adaptive Context Encoder for Nuclei Segmentation

Manuscript in Preparation *Co-author*

Designed the Compact Global Context Token module for global-context extraction with token-to-pixel attention.

SAE-MRF: Scale-Adaptive Encoder with Multi-Receptive-Field Blocks

Accepted — ICCIT 2025 *1st author*

Replaced standard encoder blocks with multi-receptive-field (MRF) modules weighted by a Scale-Attention Gate, achieving consistent Dice/IoU gains over U-Net-type baselines on the MoNuSeg dataset (5-fold cross-validation).

Risk-Aware SVC Placement on a Renewable-Dominated IEEE 14-Bus System

Accepted — IEEE WIE-ECE Conference 2025 *1st author*

Developed a Monte-Carlo-based framework incorporating stochastic load variation, solar/wind uncertainty, and N-1 contingencies; evaluated SVC placements using a unified loss–voltage deviation metric; and demonstrated that CVaR-optimized configurations outperform greedy approaches.

CO-CURRICULAR ACTIVITIES

Team Interplanetar — BUET Mars Rover Team Dhaka, Bangladesh

- *PCB Manufacturing Lead, Electrical & Communication Subteam* *July 2024 – Mar 2025*
  Designed the rover's latest robotic arm control PCB, managed system-wide electronics including wheel-control and scientific analysis boards, and led electrical testing, QA, and integration. Additionally supervised junior members during subsystem deployment.
- *Senior Member, Electrical & Communication Subteam* *Dec 2022 – July 2024*
  Contributed to PCB design, debugging, sensor interfacing, wiring, and overall subsystem integration. Conducted lab tests and assisted in preparing the rover for field trials.

Instructor — Interplanetar Workshop 2023 Dhaka, Bangladesh
Electrical & Communication Subteam *Nov 2023 – Dec 2023*

Conducted hands-on workshops on microcontroller boards, sensors, Arduino/ESP32 prototyping, and SPICE-based circuit simulation using Proteus and PSPICE.

BUET Robotics Society — Team Nuvola Dhaka, Bangladesh
Electronics Contributor *2023 – 2024*

Contributed to electronics development for a Line Following Robot and a Micromouse maze-solver, including circuit design, sensor interfacing and power management.

PROJECTS

Prochesta v3.0 — BUET's Mars Rover 2022–2024
Developed arm-control PCB, wiring, and sensor integration; performed full-system debugging and field-test validation. Rover participated in URC 2023, ERC 2023, ARC 2023–24.

Prottasha v1.0 — Concept Mars Rover (IRDC) 2023
Conceptualized and architected complete electrical system (power distribution, motor drivers, sensors, communication, heating system).

Skin-Lesion Diagnosis Pipeline (ISIC 2017) 2025
Developed a 3-stage pipeline (MRP-UNet segmentation, mask-aware classification, CAM-enhanced refinement); achieved Dice 0.8712, Jaccard 0.7965, classification accuracy 73%.

Battery Charge Controller with Auto Cutoff 2024
Designed a LiPo charger from scratch by designing separate buck-converter and charger PCBs and validated cutoff accuracy experimentally.

Kvasir-AnswerNet: Single-Word Medical VQA 2025
Worked on a VQA project using the Kvasir-VQA dataset, where my model predicts single-word answers reliably.

AWARDS & ACHIEVEMENTS

- **Anatolian Rover Challenge (ARC) 2023** July 2023
  Team Position: **1st** (Preliminary Round), **10th** (Final Round); Electrical Sub-team Member
- **International Rover Design Challenge (IRDC) 2023** May 2023
  Team Position: **15th**; Electrical Sub-team Member
- **University Rover Challenge (URC) 2023** June 2023
  Team Position: **27th**; Electrical Sub-team Member
- **Dhaka Education Board Scholarship (General)** 2020, 2018
  Awarded by the Ministry of Education of Bangladesh
- **Kazi Serajul Islam Gold Medal (Best Girl of the Year 2017)** 2017
  Awarded by alma mater Viqarunnisa Noon School and College for outstanding academic and co-curricular excellence.