Sudipto Mondal

RESEARCH SCHOLAR· ENTREPRENEUR · ROBOTICS ENTHUSIASTS · PROGRAMMER · WEB DEVELOPER
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About Me

Date of Birth (DOB) 01.01.2002

Career Summary

Sudipto Mondal (born 2002, Rajbari, Dhaka, Bangladesh) received the B.Sc. in Electronics and Telecommunication Engineering (ETE) from Rajshahi University of Engineering and Technology (RUET), Bangladesh, in 2025. He has authored or co-authored ***45+ peer-reviewed papers and one book chapter***, with research interests in power electronics, power quality, electrical machines and drives, renewable energy integration, DSP-based hardware implementation, and smart microgrids. He received Best Paper/Presenter Awards at ICECE 2022, IEEE ASEMD 2023, and EICT 2023, and serves as a reviewer for IEEE Transactions on Transportation Electrification, IEEE Transactions on Industrial Electronics, IEEE Open Journal of the Industrial Electronics, IEEE Transactions on Applied Superconductivity, IET Electric Power Application, and IEEE Access.

Beyond academics, he is the Founder & CTO of Edu-Explorer, a government-funded ed-tech startup, and a Lead STEMxpert at STEMx365, contributing to programs in collaboration with MIT, NASA, and JAXA. He has secured 52 national and international awards across robotics, programming, and innovation. He is also Head of Electrical at Team Crack Platoon, Bangladesh's first Formula SAE electric vehicle team. He has extensive hands-on experience in embedded systems, underwater robotics, and drone-based robotic platforms, along with strong expertise in hardware-centric system design.

Career Objective

- To work as a software and telecommunication engineer at MAANG & build my own startup.
- To work as a power electronics and robotics researcher and contribute more in social and local development.

Core Skills

Research MATLAB/Simulink · PLECS · Ansys Electronics · MS Visio
Robotics/Electronics STM32 · DSP Processor · TMS320F28335 Control Card · ATmega328p · Power Electronics · ROS
PCB EasyEDA · Express · Proteus
Programming C++/C · Python · Java · Assembly-8086
Web Development Express · WordPress · HTML/CSS/JavaScript · SQL · REST APIs · PHP
Graphics Design Photoshop · Premiere Pro · After Effects · Final Cut Pro · Adobe Photoshop · Adobe Illustrator
App Development Android Studio · XCode · Unity

Academic Qualification

Graduation — *Rajshahi, Bangladesh*
B.Sc. in Electronics and Telecommunication Engineering (ETE) — *July 2025*
University: Rajshahi University of Engineering and Technology (RUET)
CGPA: 3.67 (5th in the Dept. out of 57 students) | Highest CGPA in class after 8th Semester: 3.81

Higher Secondary School Certificate (HSC) — *Dhaka, Bangladesh*
Group: Science | Passing Year: 2019 — *June. 2017 – Dec. 2019*
College: Dhaka Residential Model College, Mirpur– 1207, Dhaka
GPA: 5.00

Secondary School Certificate (SSC) — *Rajbari, Dhaka, Bangladesh*
Group: Science | Passing Year: 2017 — *Jan. 2016 – Feb. 2017*
College: Rajbari Government High School, Rajbari Sadar, Rajbari
GPA: 5.00 (District 2nd Position in Merit)

Junior School Certificate (JSC) — *Rajbari, Dhaka, Bangladesh*
Group: General | Passing Year: 2015 — *Jan. 2014 – Dec. 2014*
College: Rajbari Government High School, Rajbari Sadar, Rajbari
GPA: 5.00 (District 1nd Position in Merit)

Robotics/Hardware Experiences

Underwater Robotics Experience (RoboSub 2025, Irvine, California) — *Documented*
Team BengalSub – Project Technical Lead | Autonomous Underwater Vehicle (AUV) — *Feb. 2025 – Aug. 2025*

- Worked on system-level integration of electrical, control, and software subsystems, including Pixhawk-based low-level control, ROS-enabled autonomy, and MAVLink/MAVROS communication.
- Contributed to embedded systems and power architecture, including multi-battery power distribution, buck/boost regulation, current sensing, kill-switch safety, and EMI-aware wiring for underwater reliability.
- Involved in autonomous navigation and perception, integrating YOLOv8-based underwater object detection accelerated on NVIDIA Jetson Orin Nano, sensor fusion with IMU and depth sensors, and behavior-tree-based mission planning.

Drone Based Autonomous Aerial Env. Monitoring System (World Robot Olympiad, Singapore) *Documented*

Team SORA LABS – Team Coach | E Scope: Drone-based IoT sensing and full-stack monitoring platform *Feb. 2024 – Nov. 2025*

- Designed and supervised a modular quadrotor platform for real-time air quality monitoring, integrating multi-sensor payloads (CO_2, PM, VOCs) with stable flight and vibration-aware hardware design.
- Led the end-to-end data pipeline: Sensor Data → ESP32 → MQTT Broker → Node.js Backend → MySQL Database → REST APIs (PHP) → Web Dashboard, enabling low-latency data streaming and visualization.
- Developed and validated custom PCBs for power distribution, communication, and ESP32-based processing units, ensuring noise-resilient operation under dynamic flight conditions.

Formula Electric Vehicle Racing Car Experience (Formula SAE Japan 2025, Nagoya, Aichi, Japan) *Documented*

Team Crack Platoon – Head of Electrical | Electric Formula Student Car *Feb. 2024 – Sept. 2025*

- Designed the complete high-voltage (HV) using Tesla battery and low-voltage (LV) system architecture of a EV powertrain.
- Led the design and validation of safety systems, including Shutdown System (SDS), Pre-charge and Discharge Circuits, BSPD, RTML, RTDs, TSAL, TSSI, emergency shutdown loops, and HV Isolation Monitoring Device (IMD), meeting Formula SAE Japan regulations.
- Implemented non-programmable IC based pre-charge and discharge control logic to mitigate inrush current and ensure safe DC-link charging, coordinating contactors, resistive paths, and fault detection with Hardware-in-the-Loop (HIL) testing.

Embedded Systems & Real-Time Control Experience *Documented*

Power Electronics Control, Motor Drives, and Communication Systems *Mar. 2023 – Feb. 2025*

- Extensive experience in bare-metal programming and low-level firmware development for STM32 and ATmega328P MCUs, register-level configuration of MCU peripherals, including TIMx, GPIO, RCC, NVIC, ADC, DMA, and USART, bypassing high-level abstractions.
- Designed and implemented single-phase and three-phase PWM generation for inverters and motor drives, including SPWM, dead-time insertion, and complementary PWM using advanced timer peripherals for VFDs.
- Interfaced multiple MCUs (STM32 <-> STM32, STM32 <-> ATmega328P) using CAN, SPI, UART/USART, and serial protocols with advanced prescaler and clock tree configuration, supporting up-counting, down-counting, and center-aligned timer modes.

Achievements

Silver Medal – World Robot Olympiad (WRO) 2025, Singapore *Score*
Silver medal winner (Team Coach: SORA Labs) in Future Innovators Category: 9th out of 73 teams worldwide *Nov. 2025*

3rd PR Award – Formula SAE Japan 2025, Nagoya, Japan *Certified*
Got 3rd place in PR award, passed all EV inspection and ranked overall 18th out of 93 global teams *Sep. 2025*

Special Reorganization – RoboSub 2025, California, Irvine *Certified*
TDR: 24th, Demonstration Video: 20th, System Assessment: 38th out of 58 teams *Aug. 2025*

Top 4 Project Award from Dept. of ETE, RUET (Communication based Project) view *Certified*
Selected as top 4 project in the project fair based on communication system organized by dept. of ETE, RUET *Feb. 2024*

Best Research Paper Award at EICT 2023 organized by Dept. of EEE, KUET view *eict2023.kuet.ac.bd*
Best Research Paper Award among 300+ submissions *Dec. 2023*

Best Research Paper Award at ASEMD 2023, Tianjin, China view *ASEMD2023*
Best Research Paper Award among 800+ submissions *Oct. 2023*

Best Oral Presentation (Research Paper) at ASEMD 2023, Tianjin, China view *ASEMD2023*
Best Oral Presentation among 500+ presenters *Oct. 2023*

Top 5 Project Award from Dept. of ETE, RUET (Electronics based Project) view *ete.ruet.ac.bd*
Selected as top 5 project in the project fair based on electronics organized by dept. of ETE, RUET *Sept. 2023*

Winner – Digital Khichuri Challenge by UNDP, ICT Division view *UNDP BD*
Got the championship title in Rajshahi Cohort from DKC *Sept. 2023*

Startup Funding by Government (10 Lakh) view *idea.gov.bd*
10 LAKH BDT Funding by National Government Project Funding *April. 2023*

BdApps National Hackathon 2022 view *bdapps.com*
4st prize Nationally *Dec. 2022*

The 12th International Conference on Electrical and Computer Engineering (ICECE) view *icece.buet.ac.bd*
Best research paper award *Oct. 2022*

1st Runner Up - RUET CSE FEST 2K22 view *CSE FEST*
Achieved 1st Runner Up title in RUET CSE Fest 2022 in hardware showcasing category *June. 2022*

International Conference on 4th Industrial Revolution view *manarat.ac.bd*
1st prize in Bangladesh organized by UGC, Bangladesh *Dec. 2021*

1st Runner Up - 2nd KIBO Robot Programming Challenge by NASA & JAXA view *stemx365.org*
Issued By: STEMx365, NASA, JAXA *Aug. 2021*

International Robot Olympiad 2020 view *iroc.org*
Technical Award Winner- Creative Category *Jan. 2021*

Bangladesh Robot Olympiad 2020 view *bdro.org*
Bronze Medalist- Creative Category *Sept. 2020*

Digital World 2017 view *a2i.gov.bd*
Champion- Education Ministry *Dec. 2017*

CISCO IoT Hackathon view *ciscoiot*
Champion *Mar. 2017*

Notre Dame Annual Science Fest 2017 view *ndscbd.org*
Champion- IT Category *Dec. 2017*

Creative Talent Hunt 2017 view — *creativetalenthunt*
Regional Champion — *Mar. 2017*
UIU-Venturas First Robotics Competition for Colleges view — *venturas*
1st Runner Up — *Mar. 2018*
National High School Programming Contest (NHSPC) view — *nhspc*
Regional Champion — *Mar. 2016*
36th National Science and Technology Week view — *sciencemuseum*
Champion- Project Display — *Aug. 2015*
I-GEN view — *igen*
Regional Champion — *April. 2015*

Research Papers (46 Published, 2 On Review, Citations: 297)

Selected publications are provided as follow. All publication at : GOOGLE SCHOLAR

- S. Mondal, S. P. Biswas, M. R. Islam, R. Shah and K. M. Muttaqi, "A Compact Generalized Switched-Capacitor MLI with a Modified Single-Carrier PWM Scheme for Transformerless PV Interfacing," in IEEE Transactions on Industry Applications, 2025, doi: 10.1109/TIA.2025.3609732.
- S. Mondal, S. P. Biswas, M. R. Islam and S. M. Muyeen, "A Five-Level Switched-Capacitor Based Transformerless Inverter With Boosting Capability for Grid-Tied PV Applications," in IEEE Access, vol. 11, pp. 12426-12443, 2023, doi: 10.1109/ACCESS.2023.3241927. [*Cite: 59*]
- S. Mondal, S. P. Biswas, M. S. B. Islam, M. R. Islam and A. Fekih, "A 3-Phase Switched-Capacitor Single-Source MLI With Self-Voltage Balancing and Boosting Ability," in IEEE Transactions on Applied Superconductivity, vol. 34, no. 8, pp. 1-5, Nov. 2024, Art no. 3801505, doi: 10.1109/TASC.2024.3450847. [*Cite: 04*]
- S. P. Biswas, S. Mondal, M. R. Islam, S. Haq, M. K. Hosain and R. N. Shaw, "Advanced Level Shifted Carrier Based Bus Clamping PWM Technique for a 54-Pulse AC-DC Converter Fed MLI Based Induction Motor Drive" IEEE Transactions on Industry Applications.[*Cite: 21*]
- S. Mondal, S. P. Biswas, M. R. Islam, M. K. Hosain and R. Raad, " A seven-level switched-capacitor based transformerless inverter with modified PWM strategy to enhance the performance of grid-connected PV systems," IET Power Electronics, 1–14(2024). [*Cite: 16*]
- N. I. Nahin, S. P. Biswas, S. Mondal, M. R. Islam and S. M. Muyeen, "A Modified PWM Strategy With an Improved ANN Based MPPT Algorithm for Solar PV Fed NPC Inverter Driven Induction Motor Drives," in IEEE Access, vol. 11, pp. 70960-70976, 2023, doi: 10.1109/ACCESS.2023.3291339. [*Cite: 44*]
- S. Mondal, S. P. Biswas and M. K. Hosain, "A Single-Carrier PWM Technique for Grid-Tied Modular Multilevel Cascaded Inverters," 2023 6th International Conference on Electrical Information and Communication Technology (EICT), Khulna, Bangladesh, 2023, pp. 1-6, doi: 10.1109/EICT61409.2023.10427946. [*Cite: 03*]
- S. Mondal, S. P. Biswas, M. S. Bin Islam, M. R. Islam and R. Shah, "A Hybrid PWM Strategy for SMES Integrated Grid-Feeding Transformerless PV Inverters," 2023 IEEE International Conference on Applied Superconductivity and Electromagnetic Devices (ASEMD), Tianjin, China, 2023, pp. 1-2, doi: 10.1109/ASEMD59061.2023.10369095. [*Cite: 02*]
- S. Mondal, S. P. Biswas and N. I. Nahin, "Advanced Switching Sequences for a Multiphase Interleaved DC-DC Boost Converter Using TMS320F28335 DSP Control Card," 2022 12th International Conference on Electrical and Computer Engineering (ICECE), Dhaka, Bangladesh, 2022, pp. 296-299, doi: 10.1109/ICECE57408.2022.10088612. [*Cite: 10*]
- S. Mondal, S. P. Biswas, M. R. Islam and R. Shah, "A New Modulation Technique for H6 Transformerless Inverter to Minimize Leakage Current with Reduced Power Loss," 2022 IEEE 1st Industrial Electronics Society Annual On-Line Conference (ONCON), kharagpur, India, 2022, pp. 1-6, doi: 10.1109/ONCON56984.2022.10126632. [*Cite: 04*]

Projects

1. **Custom Gate Driver PCB (IGBT)** View Project — Mar 2025
2. **ESP32 IoT-Based Real-Time Data Monitoring System** View Project — Mar 2024
3. **IGBT based pure sine wave inverter** View Project — Dec 2022
4. **BICSAA Government Website** View Project — Jul 2023
5. **AR Application : Meta Platform** View Project — Mar 2023
6. **Edu-Explorer EdTech Application** View Project — Jun 2022
7. **BUS GURRD** View Project — May 2022
8. **AI Based Low Cost Portable Ventilator** View Project — Nov 2021
9. **Robot in Movie - Automated Vehicle System** View Project — Sep 2020
10. **Automated Vehicle System for Future Transportation - V2** View Project — Oct 2020
11. **Automated Vehicle System for Future Transportation - V1** View Project — Sep 2020
12. **Free Breather 71** View Project — Apr 2020
13. **The Intubation Aerobox - COVID19 Safety Project** View Project — Mar 2020
14. **Human Rescuable Car - HRC** View Project — Jun 2017
15. **Disaster Management Robot** View Project — Jun 2016
16. **Advanced Quadcopter** View Project — Feb 2016
17. **Angle Changing Periscope** View Project — Jul 2016
18. **8 hour electricity from 100gm fuel** View Project — Jan 2015

Working Experience

Research Assistant — *Google Scholar*
Dr. Md. Rabiul Islam | SPB Research Group — *March. 2022 – On-Going*

- Conducted research in Power Electronics Converters, Multilevel Inverters, Modulation, and Renewable Energy Interfacing.
- Designed experimental hardware of 3-Phase Inverter for Drive Applications, Cyclo Converter, 54-Pulse Rectifier, 3-Phase 7-Level CHB Inverters, Different Topologies of Switched-Capacitor Converters, PV Fed NPC Inverter, and Interleaved DC-DC Boost Converters.
- Wrote, reviewed, authored, and co-authored more than 35 technical papers in international journals and conference proceedings.

Founder and Chief Technical Officer (CTO) *edu-explorer.com*
Edu-Explorer – An educational platform focused on Simulation and AI *July. 2022 – On-Going*
- Webmaster
- Website Architecture
- Backend Web Development (PHP, MySQL)
- VPS, API, Payment Gateway, Security Specialist

Head of Electrical – Team Crack Platoon *teamcrackplatoon.com*
Team Crack Platoon – Bangladesh's first Formula SAE team, R&D of EVs *June. 2023 – On-Going*

Web Development *abexita.com*
ABEXITA, GO-Learning, Gov Project *June. 2021 – Dec. 2024*
- Backend Development – PHP, JS, MySQL
- CMS Development – Wordpress, Custom Theme Development, Custom Plugin Development

App Development *bdapps.com*
BDAPPS – National App Store for Bangladesh *March. 2021 – Jan. 2025*
- Lite App Developer – USSD Based Service Application
- Pro App Developer – Android Studio, XCode

Freelancing *fiverr.com*
Fiverr *Jan. 2018 - Jul. 2020*
- As an Android App Developer- Small Games, Web Based App
- As Graphics Designer- Photo Retouch, Banner & Backdrop, Poster Design

Volunteer Working Experience

Peer Reviewer *ieee.org*
International Journals and Conference Proceedings *October 2023 – On-Going*
- IEEE Access
- IEEE Transactions on Industrial Electronics
- IEEE Transactions on Applied Superconductivity
- IEEE Transactions on Transportation Electrification
- IEEE Kansas Power and Energy Conference (KPEC)

Bangladesh Robot Olympiad (BdRO) *bdro.org*
Academic Team Member *March 2021 – May 2024*

Excellence Bangladesh *ExBD*
Campus Team Member *April, 2020 – June 2023*

Dhaka Residential Model College Science Club *drmcsc.com*
President – Organized a Science Fest market size of 13.4 Lac. *Sept. 2018 – Dec, 2019*
General Volunteer *Nov. 2017 – Sept. 2018*

STEMx365 – An International Platform for Space Robotics and STEM *stemx365.org*
Lead Web Developer and Simulation Expert *Aug. 2020 – On-Going*

Astronomy and Science Society of RUET (ASSR) *assr.ruet*
General Team Member *Feb. 2020 – May 2021*

Rajbari Govt. High School Math and Science Club *rmsc.club*
Founder and Management Team Member *Jan. 2016 – June 2022*

Arayabhatta Math School, Rajbari *aryabhatagonitpathshala*
General Secretary *Jan. 2020 – March 2023*

Extra-Curricular Activities

Leadership Public Speaking · Team Work · Event Organize
Music Singing · Guitar · Harmonium · Ukulele
Gaming Competitive Valorant · Competitive PUBG Mobile
Sports Badminton · Throw the Ball

Co-Curricular Activities

Creative Talent Hunt Science Project · Math and Computer · Language and Literature
Programming Problem Solving with C (200 +)

Corporate Social Responsibilities (CSR) Activities

Tech for Change – A non-profit organization to eradicate Cyberbullying and Hate speech from cyberspace
Worked as a Founder, Field Member and Application Developer *June. 2023 – On-Going*

Computer Skill

MS Office MS Word · MS PowerPoint · MS Excel · MS Access · MS Visio
Software Photoshop · Premiere Pro · After Effects · Final Cut Pro · Adobe Photoshop · Adobe Illustrator · Android Studio · XCode · Unity · CAD · Solid Works · Fusion360 · MATLAB · PyCharm · Arduino · VS Code · EasyEDA · PLECS · Ansys Electronics · Vivado Design Suite · CST Studio · VS Code
Operating System MAC · Windows · Linux (Ubuntu, Cloud Linux)

Language Skill

Sound at Bangla · English

Working Experience Hindi

Reference

Mizanul Chowdhury

- Nasa's Astrobee/SPHERES scientist, Founder of Stemx365
- Architect and System Admin of ZERO Robotics at MIT System Laboratory, Department of Aeronautics and Astronautics, Room 37-340

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