

DEBANSHU SARKAR

Embedded Systems | Control Systems & Autonomy | IoT & Instrumentation
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[Portfolio](#) | [GitHub](#) | [LinkedIn](#)

SUMMARY

Electronics and Instrumentation Engineering student (B.Tech, MAKAUT, 2027), with a track record of shipping production developer tools (2,000+ acquisitions across published extensions) and building embedded, control, and autonomous systems in C, C++, Python, and JavaScript. Hands-on experience with PID tuning and sensor interfacing, plus coursework-level PLC ladder logic. Currently doing research on autonomous drone swarms with edge AI at IIT Kharagpur under Prof. Sudip Misra in the SWAN Lab.

EDUCATION

B.Tech, Electronics and Instrumentation Engineering

Institute: Techno Main Salt Lake | University/Board: Maulana Abul Kalam Azad University of Technology (MAKAUT), Kolkata | Year of Passing: 2027 (expected) | Score: CGPA 7.65 | Course Type: Full-time

Class XII (ISC)

Institute: The Assembly of God Church School | University/Board: CISCE | Year of Passing: 2023 | Score: 88% | Course Type: Full-time

Class X (ICSE)

Institute: The Assembly of God Church School | University/Board: CISCE | Year of Passing: 2021 | Score: 85% | Course Type: Full-time

No academic backlogs. Diploma and PG: not applicable.

STRONG SUBJECTS

Embedded Systems, Microprocessors and Microcontrollers, Control Systems (PID tuning), IoT and Wireless Sensor Networks, Sensors and Transducers, Process Control (cascade control, DCS), Data Structures and Algorithms, Object-Oriented Programming.

INTERNSHIP EXPERIENCE

Research Intern, SWAN Lab, IIT Kharagpur

2026 - Present

Under the guidance of Prof. Sudip Misra

- Researching autonomous drone swarm architecture using SLMs for edge AI mission planning, with LoRa based multi hop mesh networking between drones.
- Working on on-device inference and decision making for swarm coordination, including embedding based task self selection and safety constrained mission planning.

TECHNICAL SKILLS

Languages: C, C++, Embedded C, Java, Python, Assembly (8085/8086)

Control and Instrumentation: PID tuning, sensor and transducer interfacing, closed loop feedback control, PLC ladder logic (coursework level)

Embedded and Protocols: ESP32, Arduino, Raspberry Pi 4B, ATmega328P, ARM microcontrollers; UART, I2C, SPI, GPIO, PWM, ADC, MQTT, MAVLink

Systems, Tools and Cloud: Git/GitHub, EasyEDA, MATLAB, oscilloscope and logic analyser debugging, SQLite, MySQL, ThingSpeak

AI and Vision: OpenCV, YOLOv8, MobileFaceNet, Whisper, Llama 3.2 on-device LLM

SHIPPED SOFTWARE

Code Janitor

2025 - Present

Node.js, JavaScript, VS Code Extension API, Arduino IDE 2.x | github.com/Debanshu2005/code-janitor

- Published VS Code and Arduino IDE extension with 2,000+ total acquisitions, 300+ installs, and a 5 star Marketplace rating; built AI powered code formatting, codebase graph visualisation, and an Arduino IDE AI agent across 236 commits (v0.9.7 to v1.0.2).
- Integrated multiple AI providers (Ollama, Groq, Anthropic, NVIDIA NIM) with self healing performance monitoring and persistent workspace memory.

IntelScan

2026

Python, PyPI | github.com/Debanshu2005/IntelScan

- Published a Python CLI tool on PyPI (pip install intelscan) that auto generates workspace manifests and AI agent context files, with a full test suite and PyPI Trusted Publishing.

PROJECTS UNDERTAKEN

Autonomous Quadcopter (Team Project)

2026 - Present

APM 2.8, Raspberry Pi 4B, Python, MAVLink, ESP32 | github.com/debadityap/Drone_software

- Team project with a university flight software group; contributed the Python mission control layer over ArduPilot via MAVLink (waypoint navigation, pre flight calibration, arming safeguards) as a major contributor.
- Tuned PID control loops (roll, pitch, yaw, altitude hold) on the APM 2.8 flight controller and implemented IMU anomaly triggered soft landing with LoRa SX127x telemetry over an ESP32 ground station.

Smart Rescue Glove (Registered Design, Govt. of India)

2025 - 2026

ESP32, PVDF piezoelectric sensors, mmWave radar, AMG8833 thermal sensor | Design No. 504830-001

- Co-developed an IoT-based smart rescue glove; led sensor integration, firmware development, and hardware design, combining PVDF piezoelectric sensors, mmWave radar, an AMG8833 thermal camera, and IMU data on an ESP32, with sensor readings transmitted over WiFi.
- Design officially registered by the Indian Patent Office under the Designs Act, 2000 (Class 29-02), as part of a 12-member team.

Buddy, Mobile AI Robot

2026 - Present

Raspberry Pi 4B, Arduino, YOLOv8, Llama 3.2, OpenCV, UART | github.com/Debanshu2005/Pi_Buddy

- Built a modular system with an on-device LLM (Llama 3.2 3B), Whisper STT, YOLOv8 detection, and face recognition, each run as an isolated service over an Arduino controlled 4WD platform.

ACHIEVEMENTS

- Finalist, Brainwave 2.0 Hackathon (DTU); Participant, Smart India Hackathon 2024 and 2025, and National Robotics Hackathon.
- Maintainer of 15+ public GitHub repositories spanning systems software, embedded systems, robotics, and developer tools.