Saju Khakurel _Embedded Systems, Computing & Firmware_

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👁 Blogs   🔗 Website

🪪 Profile

Final-year Erasmus Mundus MSc student in Embedded Intelligent Nanosystems Engineering with strong foundations in embedded systems, computing, and software–hardware integration. Hands-on experience with STM32-based embedded C/C++ development, system-level debugging, and real-hardware validation. Interested in contributing to research-driven computing projects involving systems, data, and advanced software tools.

🎓 Education

Erasmus Mundus Joint Master of Embedded Intelligent Nanosystems Engineering, University of Orléans (France) • University of Siegen (Germany) • Hellenic Mediterranean University (Greece) 🔗
2024/10 – Present

Bachelor's Degree in Electronics & Communication Engineering,
Tribhuvan University, Pulchowk Campus 🔗
2017 – 2022 | Nepal

💡 Skills

Programming and Computing (C, C++, Python, MicroPython, SQL, MATLAB/Simulink, Linux, Git)

Embedded Systems (STM32 (CubeIDE, HAL), ESP32, RaspberryPI, GPIO, UART, SPI, I2C, CAN, timers, interrupts, RTOS)

Connectivity & Data (BLE, LoRa, MQTT, TCP/IP (basic), sensor data acquisition)

Tools & Environments (Linux, Octave, LTspice, ROS(RViz, Gazebo), VS Code)

Machine Learning & AI (Classical ML models, Deep Learning, TensorFlow Lite deployment, feature extraction)

Electronics (Analog & digital electronics, sensors, basic PCB design (KiCad))

🌐 Languages

English C1 | Nepali | French A1 |
German A1.1

💼 Professional Experience

Embedded Systems Engineer — Vehicle Software,
Yatri Design Studio 🔗
2021/12 – 2024/09 | Nepal
- Developed embedded C/C++ firmware for STM32-based systems used in electric vehicles.
- Worked on firmware features involving device startup, communication interfaces, and diagnostics.
- Supported the development and validation of OTA software update workflows for embedded devices and charging stations.
- Performed firmware testing, debugging, and log analysis on real hardware prior to deployment.
- Assisted in system-level validation using hardware test benches to ensure reliable device behavior.
- Collaborated with firmware, hardware, and backend teams during integration and testing phases.

Hardware Designer and Embedded System Programmer,
Robotics Club, Pulchowk Campus 🔗
2018 – 2020 | Lalitpur, Nepal
- Designed and tested PCBs for mobile robots used in national robotics competitions.
- Developed embedded firmware for sensor integration and encoder-based motion correction

Avionics Systems Designer, Team Member, NEAR Aerospace
2020 | Nepal
- Designed and implemented a microcontroller-based data-logging system, integrating sensors via SPI and validating data acquisition on hardware.

📁 Academic Projects

NAST-Funded Disinfection Robot 🔗 , Embedded Disinfection Robot
Designed embedded hardware and firmware for a Bluetooth-controlled spraying system, focusing on reliable actuator control.

Wearable Embedded System (Bangle.js 2) 🔗
Implemented real-time sensor data acquisition and processing on a resource-constrained embedded device.

SLAM (TinySLAM) under ROS 🔗
Implemented particle filter SLAM with simulation & visualization in ROS (rviz/gazebo).

Rockbye Baby
Developed a sensor module using a 555-timer-based humidity detection. | Awarded LOCUS 2020 Winner.

Automatic Modulation Classifier using DL 🔗
Built DL-based LSTM models to classify modulation types in noisy signals; explored Bi-LSTM and attention layers for improved accuracy.

📖 Publications

Book Contribution
- Maharjan, Asim, and Saju Khakurel. "Introduction to IoT." IoT, Machine Learning and Blockchain Technologies for Renewable Energy and Modern Hybrid Power Systems, edited by C. Sharmeela et al., River Publishers, 2022, pp. 1–23

⚙️ Volunteering & Leadership

Instructor & Technical Mentor (Voluntary), 2019 – 2024
Robotics Club Pulchowk Campus • Locus • Godawari Residential School • Skill Tour Nepal
- Taught Arduino, sensors, motors, PCB design, and embedded programming to university and school students.
- Mentored student teams for robotics competitions and science exhibitions.
- Introduced basic programming and robotics concepts to school children through hands-on workshops.

EV Awareness & Outreach – Yatri Energy (USAID-supported) 2024/04 – 2024/05
- Led EV awareness sessions and public discussions across major Nepali cities, delivering technical presentations and interactive demonstrations. Nepal