

Sakar Pathak

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Education

B.E. in Electronics, Communication and Information Engineering (78.04%)

Pulchowk Campus, Tribhuvan University

2018-2023

Relevant Modules:

Engineering Mathematics, Probability and Statistics, OOP, Data Structures and Algorithms, Artificial Intelligence, Microprocessor, Computer Networks, Embedded System, Control System, Filter Design, Wireless Communication, Antenna and Propagation, Digital and Analog Communication System, Electric Circuits and Machines.

Work Experience

Co-Founder, CEO

Axar Space Pvt. Ltd.

Feb 2024 - present

Kathmandu, Nepal

Founded and managed a robotics and education company with two key brands.

1. Makit Labs: Robotics Lab to ease a student's entry to robotics.

- Developed and sold the Makit Robotics Kit that teaches robotics and programming.
- Open Sourced the Makit Robot Dog kit.
- Taught weekly STEM classes to over 30 students.
- Hosted 10 workshops teaching 500+ students.

2. Third World Nerd: Youtube Channel that provides robotics education packaged as entertainment using culturally familiar examples. Some projects include:

- Capacitor Gun as a safe alternative to fireworks during national bans.
- Robot Dog inspired by Stanford Pupper when Unitree was first showcased in Nepal.
- Egg Incubator to hatch chicken eggs on farms .
- Remote-Control Boat using fiberglass to navigate flooded rivers.

Electronics Engineer

Sandbox Software Pvt. Ltd.

Jan 2024 - Apr 2024

Pokhara, Nepal

- Led development of 1000 HID devices (keyboard and mouse) using microcontrollers and ASICs.

Robotics Engineer

North Star Developer's Village

Aug 2024 - Oct 2024

Kathmandu, Nepal

- Led completion of Person Following project for an Autonomous Robot, achieving 75% accuracy.

Teaching Experience

Lecturer, Discrete Mathematics & Digital Logic

Kantipur College of Management and Information Technology

May 2024 - Sep 2025

Kathmandu, Nepal

Instructor, SAT Mathematics

Universal Institute

Jul 2024 - Sep 2024

Kathmandu, Nepal

Projects

Quadruped Robot Dog (Open Source STEM Kit)

- Developed a quadruped robot with 3-DOF legs.
- Led a team through five design iterations to achieve stable walking.
- Developed Python GUI tools for kinematics, calibration, stabilization, and real-time control.
- Optimized design for robustness, manufacturability, cost, and scalable kit production.

Reusable, Autonomous VTOL Vehicle (Thesis)

- Developed rocket body and flight computer hardware/software from scratch.
- Implemented an Extended Kalman Filter for pose estimation.
- Performed system identification for model-based control design.
- Designed and tuned feedback controllers (PID, LQR, LQG) for hover control.
- Achieved successful trajectory tracking using Model Predictive Control (MPC) in simulation.

Service and Leadership

Hardware Coordinator

Mar 2022 - Mar 2023

LOCUS 2023, Pulchowk Campus

- Led the organization of six Robotics competitions during the LOCUS 2023 exhibition, attracting hundreds of participants and more than 20,000 viewers.

Awards and Scholarships

- Ranked 24th out of 16,000 in Engineering Entrance Exam—the highest in Electronics department
- Full Undergraduate Scholarship, Pulchowk Campus
- Winner, National Science Exhibition
- Nepal Government Financial Aid during High School

Skills

Programming & Software	C/C++, Python, MATLAB/Simulink, JavaScript; ROS2 node development, FreeRTOS, STM32CubeIDE
Electronics	Analog/digital circuit design, Passive & active components (op-amps, MOSFETs, comparators, voltage regulators), Power and signal conditioning
Embedded System	Microcontrollers (Arduino, ESP32, STM32, Raspberry Pi, Jetson), Low-level interfaces (I2C, SPI, UART)
Control System	Sensor fusion (LKF, EKF, UKF), Feedback control (PID, LQR, LQG), Model predictive control (MPC), System identification
Perception & AI	SLAM, Computer vision, Convolutional Neural Networks (CNNs), Digital signal processing
Product Development	PCB design (Altium Designer, KiCad), 3D printing (Fusion 360), Simulation & modeling, Git/GitHub, Web/GUI development (Figma, React, MySQL)