Swayam Dhakal

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Personal Profile

Electronics, Communication & Information Engineering graduate with experience in IT-focused projects, system design, and technical communication. I combine engineering problem-solving with strong storytelling and creative skills from years of music production to deliver clear, user-oriented technical solutions.

Education

B.E. in Electronics, Communication and Information Engineering (78.04%) 2018–2023
Pulchowk Campus, Tribhuvan University, Nepal

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, CMO Dec 2024 - present
Axar Space Pvt. Ltd. *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.

Teaching Assistant Jun 2024 - Dec 2024
National College of Engineering *Lalitpur, Nepal*

- Tutorial and practical classes for undergraduate engineering students concerned with subject Electronic Devices and Circuit, Object Oriented Programming and Advanced Computer Programming.

Trainings

4th Annual Nepal AI School May 22, 2023 - June 1, 2024
NepAl Applied Mathematics and Informatics Institute for research (NAAMII) *Kathmandu, Nepal*

- 10-day (55 hrs lectures + 18 hrs lab sessions + 14hrs Project and Professional development sessions) Al School covering topics like Natural Language Processing (NLP),Transformers for Graph and Geometric Deep Learning, ML Foundations, Linear Algebra, Self-supervision and Active Learning, Trustworthy Al etc.

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

Event Coordinator Mar 2022 - Mar 2023

LOCUS 2023, Pulchowk Campus

- Led the organization of Robotic Competition: Robo-Soccer during the LOCUS 2023 exhibition, attracting hundreds of participants and more than 20,000 viewers.

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)