

# SULAV GAIRE

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Bhaktapur, Nepal

## RESEARCH INTERESTS

My research interests focus on Electronics, Machine Learning, and IoT, with particular emphasis on mobile computing and cyber-physical systems. I am currently exploring Wi-Fi sensing in a personal project and aim to further develop my work in these fields.






## EXPERIENCE

- Nepal Academy of Science and Technology (NAST)**  
*Innovative Research Assistant* Dec 2024 - Present  
Khumaltar, Lalitpur, Nepal
  - Developing wireless sensor network for early warning system
  - Researching tomato picking robot using robotic arm and imitation learning.
  - Handle electronics aspects of projects like hydrogen fuel cell, GPS data logger.
- ORION Space**  
*Electronics Design Intern* Feb 2022 - Aug 2022  
Duwakot Mod, Bhaktapur
  - Researched LoRa-based sensor networks in UHF band
  - Engineered educational satellites (CanSat, CUBEK) used in global space training programs [20+ countries]
  - Developed web application for real-time LoRa data monitoring

## EDUCATION

- Institute of Engineering, Tribhuvan University** Nov 2019 – April 2024  
*Bachelor's Degree* Pokhara, Nepal
  - Electronics, Communication and Information Engineering

## PROJECTS

- CUBEK & EDUCAN: Educational Satellites** 2022  
*Tools: Node.js, Arduino, PCB Design, LoRa* 
  - Engineered 1U CubeSat kit with solar power systems and LoRa communication modules
  - Developed real-time dashboard and optimized PCB design, reducing production costs by 30%
- Electronic Voting System: Biometric Authentication** 2024  
*Tools: Python, Flask, OpenCV, SHA256 Hashing* 
  - Developed secure two-factor biometric voting system with fingerprint and facial verification
  - Achieved positive user ratings from 50 test participants with intuitive, interactive interface
- Waste Classification Delta Arm** 2024  
*Tools: YOLOv8, OpenCV, Arduino* 
  - Built AI-powered sorting robot achieving 94.1% precision, winning 1st place among 50 teams
  - Engineered end-to-end system for classifying waste into four categories with delta arm mechanics
- High Altitude Weather Forecasting** 2023  
*Tools: LoRa, XGBoost, Python, Arduino* 
  - Created cost-effective LoRa-based weather prediction system for remote mountainous regions
  - Implemented XGBoost algorithm to forecast patterns from sparse environmental sensor data
- Sajilo Ambulance: Emergency Response App** 2023  
*Tools: Python, SVM, Random Forest, Flutter* 
  - Built Uber-like ambulance service with ML triage prediction (86.76% accuracy)
  - Integrated hospital recommendation system based on patient condition and facility proximity

## PUBLICATIONS


C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [C.1] Shiva Shrestha, Samman Shrestha, Prateek Paudel, Sudarshan Gurung, Sulav Gaire, Smita Adhikari (2024). **Deep Learning for Waste Management: Leveraging YOLO for Accurate Waste Classification**. In *Proceedings of the 15th IOE Graduate Conference*, Volume 15, May 2024. Institute of Engineering, Tribhuvan University. ISSN: 2350-8914 (Online), 2350-8906 (Print).

SKILLS

- **Programming Languages:** Python, MATLAB, JavaScript, Shell, C, C++
- **Web Technologies:** MERN Stack (MongoDB, Express.js, React, Node.js)
- **Database Systems:** MongoDB, MySQL
- **Data Science & Machine Learning:** Pandas, NumPy, Matplotlib, TensorFlow, PyTorch
- **Specialized Area:** IoT, Low-Power Wide-Area Networks (LPWAN), Embedded Systems
- **Other Tools & Technologies:** KiCad, LTspice, Figma, ROS2

HONORS AND AWARDS

- **Poster Presenter – WiFi-HAR: Activity Detection Using Channel State Information** 2025  
*International Conference on Science and Technology Information Management System: Practices and Experiences*  
◦ Organized by NAST and NAM S&T CENTRE)
- **National 2nd Runner-up – TECHENERGY Hackathon** 2024  
*Hitachi Energy*   
◦ Recognized among top 3 out of 20+ national teams for software testing
- **1st Place – Project Expo (Delta Arm)** 2024  
*NebiFest 2024, IOE WRC*  
◦ Ranked 1st among 50+ projects for developing a low-cost robotic arm with real-time control
- **Regional 2nd Place – Robo-Soccer** 2021  
*CAN-INFOTECH Robotics Competition*

LEADERSHIP EXPERIENCE

- **Senior Member – Robotics Club** 2020 – 2023  
*IOE, WRC*  
◦ Coordinated a 15-day robotics training for 100+ first-years freshers  
◦ Led organizing team for in-house robotics competition; 20+ teams participated  
◦ Mentored juniors in embedded systems and Arduino-based prototyping

ADDITIONAL INFORMATION

**Languages:** English (Proficient), Nepali (Native Speaker), Hindi (Intermediate)  
**Interests:** Engineering, Art, Dance

: ) *HAPPY ENGINEERING*