Sagar Chaudhary

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Summary

Electronics and Embedded systems enthusiast with hands-on experience in robotics, real-time control, sensor fusion, and cross-disciplinary collaboration. Skilled in developing hardware-software integrated systems and competing in international robotics contests.

Education

Tribhuvan University, Pulchowk Campus   *Pulchowk, Lalitpur*
B.E. in Electronics, Communication and Information Engineering   *Apr 2022 – Present*

Experience

Robotics Club, Pulchowk Campus, Robotics and Embedded Systems Engineer   *Nov 2022 – Present*

- Developed embedded systems using HAL FreeRTOS, and integrated ROS2 with LiDAR and Bluetooth controls.
- Built a wireless microscope slide control and omni-directional robot with closed-loop PID and sensor fusion.
- Designed localization systems using IMU, encoders, and IR sensors with filtering for improved accuracy.

Projects

ABU Robocon 2023   *Aug 2022 – Aug 2023*

- Designed and built two robots for ring pickup and throwing, collaborating with mechanical, electrical, and computer engineers.
- Fabricated custom PCBs integrating optocouplers, microcontrollers, and power supplies.

ABU Robocon 2024   *Aug 2023 – Aug 2024*

- Built semi-autonomous and fully-autonomous robots to pick and place seedlings and balls.
- Used computer vision (YOLO) and navigation (Nav2) to sort colored balls and target silos.

Wireless Microcontroller Programming   *May 2024 – Sep 2024*

- Developed a wireless programming system for multiple STM32 microcontrollers using an old smartphone's USB OTG and a browser-based interface.
- Created a web platform for developers on the same network to upload and deploy firmware binaries.

WiFi-Based Positioning System (Minor Project)   *Sep 2024 - Mar 2025*

- Developed a system to estimate indoor location using WiFi signal strength.
- Implemented and trained a Weighted K-Nearest Neighbors (WKNN) algorithm.

Technologies

Languages: C, C++, Python, SQL, MATLAB

PCB Design: KiCad, Altium

Embedded Systems: FreeRTOS, STM32Cube, Arduino

Other Tools: Git, Sphinx, ROS 2

Honors & Awards

Mabuchi Motor Award, Phnom Penh, Cambodia   *2023*

Tokyo Electron Award, Quang Ninh, Vietnam   *2024*

Extracurricular Activities

Tutor - Robocamp (Organized by Robotics Club & IEEE Student Branch, Pulchowk)   *July 2023*
- Conducted hands-on workshops for students on STEM course.

Organizer & Tutor - Hardware Fellowship (Organized by Robotics Club & Locus)   *July 2024*
- Led training sessions on autonomous robotics, circuit design, and PID control.
- Gained experience in team coordination and event organization.