Taraneh Rouhbakhsh

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Education

University of British Columbia — Vancouver, Canada
B.Sc. in Electrical Engineering — *Sep 2021 – Jun 2027*

Experience

Robert Bosch GmbH — Reutlingen, Germany
Hardware Engineering Intern — *Aug 2024 – Present, Internship*

- Performed signal analysis on ultrasonic piezoelectric sensor data from wafer dicing experiments using Python (FFT, noise floor subtraction, and peak analysis) to identify dominant frequency components and distinguish tool-related from sensor-related harmonics, resulting in a 39-page technical report summarizing key findings and performance insights.
- Integrated real-time pressure monitoring into a vacuum chamber test setup by interfacing an absolute pressure sensor and enabling data logging through a C-based tool while processing readings in Python, allowing real-time observation of chamber pressure and improving the accuracy of Q-factor correction factors.
- Supported measurement campaigns in various lab environments by configuring sensors, executing test runs, and generating Python plots for data visualization, which improved consistency and reliability in data collection.

Smith + Andersen — Burnaby, Canada
Junior Electrical Designer — *Sep 2024 – April 2024, Internship*

- Applied provincial building codes and used CAD/REVIT drafting software to develop and update electrical system layouts, streamlining the design process and reducing layout errors in final drawings.
- Performed load calculations and panel schedule updates in Excel to validate system capacity and ensure compliance with design standards, enhancing accuracy and efficiency across multiple projects.
- Collaborated with senior designers and project managers to coordinate drawing revisions and maintain project documentation, improving communication and overall workflow consistency within the engineering team.

Projects

Self-Balancing Robot | *GitHub*

- An Arduino-based embedded system designed to maintain upright balance using a Kalman filter and PID control. Integrated BMI270 IMU and AS5600 magnetic encoders through a TCA9548A I²C multiplexer to provide accurate feedback. Achieved stable balancing and wireless control via Bluetooth (BLE) and a custom Flutter mobile app.

Metal Detector Robot | *GitHub*

- A PIC32MX130 and STM32L051 microcontroller-based robot capable of detecting metallic objects and navigating wirelessly. Implemented radio communication for joystick-based control, real-time signal processing for target detection, and modular PCB design for sensor and motor integration.

PCB Multivibrator | *GitHub*

- A custom PCB design implementing an astable multivibrator circuit to generate periodic square-wave signals using transistors, resistors, and capacitors. Designed and simulated in Altium Designer, optimized for stable oscillation frequency and compact layout suitable for educational and prototyping use.

Engineering Design Team

AgroBot: Designed the receiver PCB for an agricultural robot using STM32 and LoRaWAN communication to transmit real-time sensor data between the robot and the control station. (Sep-April 2024)

Skills

Languages: C, C++, Python, MATLAB, SystemVerilog, VHDL, ARM Assembly

Technologies: Altium Designer, LTspice, KiCad, Quartus, ModelSim, SolidWorks, Revit, Simulink, Git, Linux, Arduino, STM32CubeIDE, ESP-IDF, PySerial, I2C/SPI/UART protocols, LoRaWAN

Methodologies: Embedded Systems Design, Signal Processing, PCB Design, Circuit Simulation, Object-Oriented Programming (OOP), Version Control, Hardware Debugging, Prototyping, Testing Validation