Sina Tahbaz

Toronto, ON

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Skills

- **Languages:** C/C++, Python, Verilog, VHDL
- **Software:** Altium, Keil μvision, Vivado, HSPICE, MATLAB, LabVIEW
- **Embedded Hardware:** STM32 (CMSIS Bare metal), FPGA, ESP32, nRF5x
- **General:** Soldering (Through hole down to 0603 SMD), Test Equipment (Oscilloscope, Function gen, Multimeter), Fab Equipment (Sputtering, E-beam, Polarized Raman), Prototyping (Design, PCB Etch, Assembly)

Projects

High Precision Closed Loop Stepper Motor control system - Client Project Jan 2023

- Developed a closed-loop system using a TMC motion controller IC, achieving a positional accuracy of $\pm$ 0.05 mm.
- Utilized a rotary optical encoder and a 0.9 degree 400 step NEMA17 motor to achieve high precision
- Implemented a compensation algorithm to account for any step losses with an accuracy of 0.2°.

PID Ball Balancing System - Industrial Control Systems Course Project Apr 2020

- Designed a ball balancing system using two Arduino boards, a time of flight distance sensor, and a servo motor
- Implemented a PID control algorithm to maintain the ball at the center of a track with an accuracy of $\pm 3\%$.
- Created a user-friendly interface to adjust PID values using three potentiometers, one for each parameter.

Smart RFID Alarm Clock - Personal Project Feb 2020

- Engineered a smart alarm clock utilizing an I2C OLED display and an SPI MFRC522 RFID reader.
- Programmed the device, using embedded C/C++, to only silence the alarm after detecting a specific RFID tag.
- Implemented ADC for real-time battery voltage monitoring and optimized firmware for ultra-low power consumption.

Laser Targeting System with Face Detection and Raspberry Pi - University Contest Project May 2018

- Built a laser targeting system using a Raspberry Pi, camera module, and two servo motors
- Integrated OpenCV libraries for face detection to aim the laser at the detected target with high accuracy

Education

MASc. in Electrical and Computer Engineering, GPA A | York University, Toronto, ON 2021-2023

- Thesis: Investigating thermal properties of 2D transition metal dichalcogenides (TMD)s using frequency domain thermoreflectance (FDTR)

BSc. in Electrical Engineering, GPA 3.54/4 | Shahid Beheshti University, Tehran, Iran 2016-2020

- Thesis Project: Design and simulation of a MEMS logic device for binary neural networks in COMSOL

Experience

Research Assistant | York University, Toronto, ON 2021-2023

- Fabricated samples of 2D materials using mechanical exfoliation of the crystal flakes
- Deposited a layer of Aluminum on top of the samples and measured the them using FDTR

Teaching Assistant | York University, Toronto, ON 2021-present

- Provided guidance and support to students in programming courses as a lab assistant
- Fostered a collaborative learning environment that encouraged student success

Research Intern | Laser and Plasma Institute, Tehran, Iran Summer 2019

- Designed and simulated a high efficiency solar dish Stirling engine using COMSOL multiphysics

Teaching Assistant | Shahid Beheshti University, Tehran, Iran 2018-2019

- Mentored students in analog circuit design, specializing in audio amplifiers and CMOS circuits
- Provided individualized support to help students succeed in course exercises