

# Sina Tahbaz

Toronto, ON

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## Skills

- **Languages:** C/C++, Python, Verilog, VHDL
- **Software:** Altium, Keil  $\mu$ vision, 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  $0.2^\circ$ .
- 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.
- 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
- Smart RFID Alarm Clock** - Personal Project Feb 2020
- Developed a smart alarm clock with an OLED display and RFID scanner to improve the morning routine
  - Configured the alarm to only turn off when a specific RFID tag is scanned.
  - The tag is placed in a remote location to ensure that the user gets up and moving in the morning

## 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