Shiva Prakash

Canadian Citizen

shiva.prakash@uwaterloo.ca
shiva.uwce.ca

Education

University of Waterloo – BASc, Computer Engineering — Sept. 2025 - April 2030

Technical Projects

Project Hermes - Raspberry Pi Game Streaming Handheld

- Designed complete handheld gaming system under strict $200 CAD budget constraint, integrating Raspberry Pi 4, custom RP2040 controller PCB, and 7" LCD display to create portable PC game streaming device
- Engineered custom USB HID controller PCB using RP2040-Zero microcontroller and GP2040-CE firmware, achieving Xbox controller compatibility and eliminating need for custom drivers or setup
- Implemented power management solution using PiSugar 5000mAh UPS with USB-C charging capability, enabling 2-3 hour continuous operation with simultaneous charging capability during gameplay
- Optimized thermal and mechanical design by integrating active cooling fan with custom 3D-printed housing, achieving stable 720p 60Hz streaming performance while meeting handheld form factor constraints

HackCharm - Interactive NFC Keychain

- Developed miniaturized PCB system integrating ESP32-S3, 128x128 OLED display, and ADXL362 accelerometer in keychain form factor, achieving total BOM cost of $49.66 CAD
- Designed low-power embedded circuit with 450mAh Li-Po battery and optimized power management, targeting multi-day operation through optimized sleep mode implementation and low-power design
- Implemented gesture recognition firmware using accelerometer data processing to detect tap and shake patterns, triggering responsive facial expressions on OLED display with <100ms latency

NFC PCB Business Card

- Engineered batteryless NFC circuit using passive power harvesting from smartphone NFC fields, integrating copper antenna design with LED indicator and data transmission capability
- Optimized antenna and impedance to maximize power transfer efficiency from NFC field, achieving reliable LED illumination and data transfer without external power
- Delivered hands-on electronics workshop teaching PCB design fundamentals to 100+ high school students aged 13-18, with each student receiving personalized functional PCB card

Duck Off Doomscrolling (D.O.D) - Computer Vision Water Turret

- Developed real-time computer vision tracking system in 4-day hackathon using OpenCV face detection, achieving sub-100ms servo positioning response for automated targeting application
- Designed precision mechanical positioning system using 2 MG996R servo motors for trigger, and pitch, achieving precise mechanical positioning within 1-meter range through closed-loop servo control and real-time feedback
- Implemented reliable mechanical actuation system with commercial water gun with servo-actuated pump trigger

Leadership

President – MDHS Student Council – Markham, ON — Sept. 2024 – May 2025

- Led student council in planning and executing school events and initiatives affecting 1,400+ student body

President – MDHS STEM Club - Markham, ON — Sept. 2024 – May 2025

- Organized electronics workshops for 100+ students, teaching PCB, CAD, and programming fundamentals

Skills

- **Hardware:** Analog/Digital Design, PCBA Design, Testing and Debugging, Prototyping
- **Tools:** KiCad, Fusion360, I2C, USB HID, Python, C++, C, Git

Portfolio

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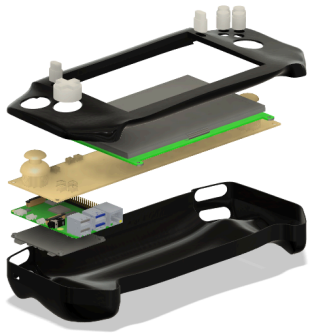

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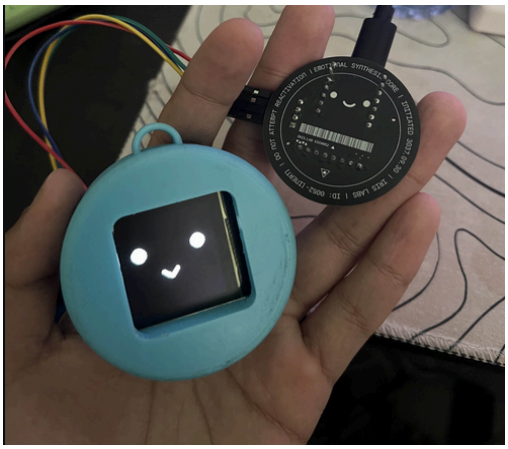

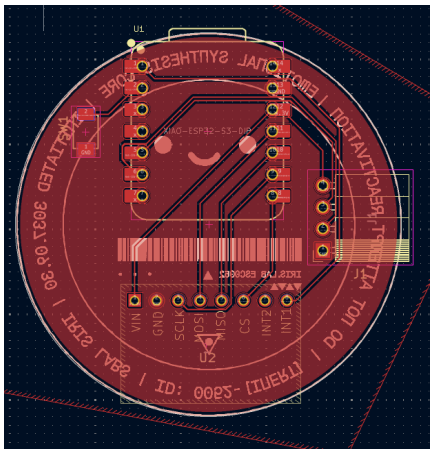

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