James Li

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Skills

- **Languages and Frameworks**: C++, C, JavaScript, MATLAB, Ladder Logic, React.js, OpenCV, Arduino, Python
- **Tools and Software**: VSCode, Git, MS Office, SolidWorks, AutoCAD, Rhino 7, React Native, Expo Go, Simulink, SimulationX, Fusion 360, Eagle/Fusion Electrical

Experience

- **Virtek Vision International** — Waterloo, ON
  Product Development Engineer — *September 2023 - December 2023*
  - Helped lead the development of a mobile app made using **React-native**, as well as a **motorized mount** product.
  - **Implemented key design decisions**, for the electrical components and communication protocols within the mount.
  - Drafted full technical and electrical drawings using **SolidWorks** and **Visio** for an electrical box and supplementary cables.
  - Assembled multiple prototype electrical boxes and helped with electrical safety and **EMF/EMI** testing at **TUV**.
  - Worked with **RabbitMQ** (STOMP) and **Swagger-API** to elegantly handle back-end data transfer.
  - Fixed various bugs and defects using **Expo-Go** resulting in **3** new version releases on app stores across all platforms.
- **VCT Group** — Kitchener, ON
  Process and Design Engineering Intern — *January 2023 - April 2023*
  - Worked independently to design and create a 3D model for a new line of EV charger pedestals in **Rhino 7**, and drafted a full set of technical drawings following **GD&T**, ready to be sent out for production in a 3 week period.
  - Played a vital role in the development of various parts, components, and accessories for solar carports and EV chargers with limited timelines to increase overall product development efficiency up to **34%**.
  - Helped with designing a **patented** water management system for a solar canopy product through iterative design processes.
  - Used a **3D printer** to model and prototype various items and parts over the course of the term.
- **University of Waterloo** — Waterloo, ON
  Computer Support Assistant — *May 2022 - August 2022*
  - Assisted in the development and installation of the deployment software for **Windows** and **Linux** computers.
  - Programmed and implemented batch files on Windows to **troubleshoot** and solve various issues and errors encountered during deployment and to **automate** installation of certain programs, increasing efficiency up to **25%**.
  - Proficiently used power tools to install or remove any computer related hardware or electronics.

Projects

- **Custom USB Macro pad**
  Python, Arduino, Fusion 360, Eagle — *May 2024*
  - Designed and built a **custom keypad** from scratch to streamline productivity with the use of custom macros and a dial.
  - Implemented a **switch matrix** to reduce the pin usage of the keypad by **17%** given limited I/O pins on the Arduino.
  - Learned Eagle to design and **fabricate** a custom PCB to allow for customization of components in the future.
  - Used **Fusion 360** to design and 3D print the housing for the components as well as the keys and dial knob.
  - Preformed cost analysis to optimize the performance/cost as well as to maintain a target budget of **$50**.
- **Two Axis Stepper Motor Machine**
  C, STM32F401RE, Nucleo IHM02A1 — *January 2024 - April 2024*
  - Implemented and evaluated **interrupt** and polling methods to optimize system performance in mechanical applications.
  - Configured an **ADC** within the microcontroller to ensure accurate **signal processing** to control stepper motor speed.
  - Analyzed and validated the performance of the system using **multi-meters**, **oscilloscopes** and **digital readouts**.
  - Utilized **GPIO** pins using **HAL** functions for limit switches as safety stops within machine.
- **Primitive OS**
  C, STM32F411RE — *April 2023 - August 2023*
  - Designed a basic **real time operating system** on the STM32F411RE micro controller board in **C**.
  - Designed OS to allocate memory for up to **31** user-defined threads, handle system interrupts, and switch threads.
  - Achieved context switching using system interrupts, software based timers, and a TCB to store thread context.

Education

- **University of Waterloo** — Waterloo, Canada
  Currently pursuing a Bachelor of Mechatronics Engineering; cumulative GPA: 3.5 — *2021-2026*

Hobbies/Clubs

- Competing for the varsity men's fencing team. My other interests include playing volleyball, reading, and listening to music.