Daniel Xie

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Education

Bachelor of Engineering Science, Computer Engineering **September 2019 - Present**
Western University, London, ON

Work Experience

General Motors - Active Safety Advanced Development Co-op Student **May 2022-Present**
General Motors CTC Oshawa - Canadian Technical Center, Oshawa, ON

- Applied customer-centric design thinking and agile project management methodologies to efficiently develop and refine computer vision and Human Machine Interface (HMI) prototypes for proof-of-concept and concept selection. Leveraged Python and OpenCV to drive rapid iteration and implementation of prototypes integrating micro-controllers, data recorders, and cameras for in-vehicle testing. These prototypes led to the initiation of features in production and a patent filing.
- As part of Virtual by 2025, spearheaded and cross-functionally collaborated with other teams across GM to develop synthetic data generation workflows using, CarMaker with Simulink, Python, and C/C++ to simulate and test sensor perception, vehicle maneuvers, and other scenarios. This reduced time and cost for data acquisition compared to using physical hardware.
- As GM Student Social Committee Communications Lead and President, created call-outs to recruit participants for user studies and organized various in-person and virtual professional development and social events.

Biophysics of Communication Lab - Research Assistant **October 2021-December 2021**
Western University, London, ON

- Developed and troubleshooted a custom Windows sound editor and generator application to integrate OCT (Optical Coherence Tomography) imaging system with data acquisition equipment and audio system. Implemented with Python and Matlab.
- Improved workflow, data sampling rate precision and data acquisition efficiency by setting project timelines, prioritized tasks, diagram creation for ideation, and communicated check-in updates to the head researchers.

Projects Experience

Western Formula Racing - Traction/GLV Team Member **September 2019-May 2022**
Western University, London, ON

- Designed the DC-DC converter (500V to 12V) and Power Distribution Module PCBs which helped the team earn third place in the Formula SAE North American EV Presentation Event.
- Developing a wireless telemetry system using Arduino, CANBUS and LoRaWAN (Long Range WAN) transceivers (programmed in C/C++) for real-time data acquisition from the VCU.

Western AI - Summer/Gideon Projects Member **September 2019-May 2021**
Western University, London, ON

- Developed and troubleshooted a Long Short-Term Memory neural network model in Python with a business applications team to predict stock prices.
- Developed, trained and troubleshooted VGG16 neural network models (in two teams) in Python that achieved ∼95% accuracy in diagnosing different Alzheimer's disease stages from MRI images and achieved ∼92% accuracy in diagnosing 14 different diseases X-ray scans.

Smart Door Lock **March 2021 - April 2021**

- Simulated and designed an Arduino-based smart door lock for a backyard shed using TinkerCAD software.
- Generated BOM and prototyped the smart door lock with BLE capability, stepper motor, and I2C LCD display on breadboard.
- Designed schematic and PCB layout for a custom Arduino shield using Eagle.

COVID Safety Smart Room Controller **February 2021 - April 2021**

- Developed embedded software in C for an ARMv7 microcontroller to track the number of occupants in a room and enforce COVID-19 safety guidelines.
- Implemented using peripherals such as timers, interrupts, counters and seven-segment displays.

FPGA CPU with Unified Cache **October 2021 - December 2021**

- Designed control logic for a RISC-based FPGA CPU using an Unified cache to fetch, decode and execute 14 instructions.
- Implemented in VHDL and used components such as up-counters, registers, multiplexers and logic gates. Minimized the amount of clock cycle executions possible to ensure efficiency in execution time.

Skills

- **CAD/ECAD:** Eagle Autodesk, Saturn PCB Design Toolkit, Onshape, SolidWorks, Cadence Virtuoso
- **Prototyping:** Arduino, ESP32, CANBUS, SPI, Breadboard Circuits
- **Programming/Scripting Languages:** Python, Java, MATLAB/Simulink, C, C++, VHDL, Rust, Bash, ARM Assembly
- **Software/Frameworks:** Git, CarMaker, CARLA, OpenCV, PyTorch, Tensorflow, Jupyter Notebooks, IntelliJ, Quartus Prime, Microsoft Visual Studio Code, Microsoft Visual Studio, Google Colaboratory, Jupyter Notebook, Android Studio, Arduino IDE
- **Tools/Skills:** Digital Oscilloscope, Multimeter, Function Generator, Soldering
- **Operating Systems:** Windows, Linux, Unix
- **Miscellaneous:** SAFe Certified,

Other Interests

Formula 1, Basketball, Stargazing, Cooking and BBQ