George Chen

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Skills

Software: C, C++, Python, VHDL, Verilog, MATLAB, Java, C#, JavaScript, HTML, CSS, CMake, Git.
Tools/Technologies: Altium, LTspice, KiCad, Micro-Cap, Quartus Prime, COMSOL, Logisim, AutoCAD, Revit.
Hardware/Lab: ESP32, STM32, PCB Design, Digital Design, Oscilloscope, DMM, Soldering, Function Generator.

Work Experience

Electrical Designer - Plan Group | *C#, AutoCAD, Revit* Jan 2023 - Apr 2023

- Conducted quality control inspections in Revit for electrical floor plan layouts for Sick Kids Hospital, resulting in a 70% reduction in completion time per layout.
- Increased CAD workflow efficiency by 10% through the development of macros and tools in C#.
- Designed and repaired plumbing and electrical fixtures in Revit for TD Bank floor plan layouts.

Projects

Door Sensor | *ESP32, C++, I2S* Apr 2025 - Present

- Developing an IoT system using two ESP32 microcontrollers and an ultrasonic sensor to detect building entry events, with real-time Wi-Fi communication triggering audio playback to I2S-connected speakers.

Logic Gates PCB | *KiCad, Micro-Cap* Jul 2025 - Present

- Designing PCB to drive basic logic gates built using transistor-transistor logic with USB-C as supply voltage.

Traffic Light Controller | *VHDL, FPGA, Quartus Prime* Jul 2024

- Designed a moore state machine and a holding register with a synchronizer to simulate a traffic light system through two seven segment displays on an FPGA using synchronous design in VHDL.

Breathalyzer Device | *C++, STM32, I2C* Sep 2023 - Nov 2023

- Architected a breathalyzer device to approximate the alcohol concentration in the air using an MQ3 alcohol sensor and STM32 Nucleo-F401RE microcontroller, displaying the result on an LCD screen via I2C protocol.
- Implemented calibration algorithm using data from changes in electron flow within the sensor for more precise readings in various environments.

Multivibrator PCB | *Altium Designer* Feb 2025

- Developed an astable multivibrator PCB in Altium Designer for stable pulse generation including schematic design, component selection, PCB layout optimization and waveform analysis.

Chess Desktop App | *Python* Jan 2024 - Mar 2024

- Developed a chess game in Python that adheres to traditional rules using the PyGame library.
- Incorporates a simple AI engine built using a minimax algorithm with alpha-beta pruning to play against.
- Employs a recursive algorithm to announce moves played by the player and engine synchronously.

Education

University of Waterloo - ***BASc, Honours Electrical Engineering*** Sep 2022 - Present

Relevant Courses: Linear Circuits, Digital Circuits and Systems