

Karen Weng

Toronto, ON M2L 1S8

☎ 416-508-6158

✉ karen.wengxt@gmail.com

🌐 [linkedin.com/in/karen-weng](https://www.linkedin.com/in/karen-weng)

🐙 github.com/karen-weng

EDUCATION

University of Toronto

Toronto, ON

Working towards a Bachelor of Applied Science in Computer Engineering + PEY Co-op

Sep. 2023 – May 2027

- Relevant Coursework: Applied Fundamentals of Deep Learning, Hardware Design and Communication, Computer Organization(Assembly), Digital Systems, Programming Fundamentals(C++), Calculus III

PROJECTS

Pomodoro Timer | C, RISC-V Assembly, FPGA DE1-SoC, NumPy, PIL, GDB

Mar. 2025

- Designed an interrupt-driven, keyboard-controlled timer with customizable study/break durations (1-99 min)
- Orchestrated time-synchronized animations for an hourglass and loading bar at 60 FPS using double buffering
- Integrated 10 audio tracks for adjustable background music, alarms, and sound effects, with volume/mute controls
- Automated PNG-to-C array conversion for transparent UI elements and RAW audio (44.1kHz) to C arrays

PrimePong – MakeUofT 2025 (Third Place Overall) | ESP8266, ESP32, MPU6050, HTTP, C++

Feb. 2025

- Designed WiFi-enabled ESP8266/32 paddles to track swings and hits using an accelerometer and force sensor
- Developed threshold-based hit and swing detection algorithms and transmitted data via HTTP to the frontend
- Integrated a real-time frontend with game footage, score, critical hits animations using React+Vite and JavaScript

Snake Game | Verilog, FPGA DE1-SoC, VGA adaptor, Quartus Prime, ModelSim

Nov. 2024

- Programmed a Snake game in Verilog for an FPGA board and displayed on VGA and HEX score tracking
- Devised a 23-state finite state machine (FSM) for snake movement (shift registers), collision detection (walls, body, and apple), apple regeneration (pseudo-random list), score updates, and pixel rendering logic
- Formulated TCL scripts and Testbenches for ModelSim simulation. Utilized block and state diagrams to plan modules.

Atlantic Hurricane Path Prediction | PyTorch, Keras, TensorFlow, NumPy, Pandas

May 2024 – Aug. 2024

- Designed, trained, and optimized an LSTM network to predict and visualize hurricane paths in 6-hour increments
- Achieved a 130km error at 144 hours for Hurricane Debby, outperforming our baseline linear regression model
- Preprocessed HURSAT data (250+ hurricanes), extracting location, velocity, wind speed, region, and time.
- Researched model architectures and tuned hyperparameters (timesteps, epochs and batch size) for optimal accuracy

InstaTeach - GenAI Genesis 2024 | Gemini API, GCP, OpenCV, Flask, React.js, Python

Mar. 2024

- A React website with a step by step Gemini generated tutorial timed to the users completions of each task
- The duration users hands stay in frame signal task completion, detected using OpenCV and Handtrack.js

EXPERIENCE

Hardware Design and Communication

Jan. 2025 – May 2025

University of Toronto, Hardware Design and Communication

Toronto, ON

- Collaborated in a team of 3 to build a limiter, bandpass filter, quadrature mixer, and amplifier for a radio
- Researched and evaluated design solutions to meet requirements, applying Agile for iterative development
- Simulated in LTspice, prototyped on breadboards, and tested PCBs with oscilloscopes and custom Python scripts
- Designed a PCB in Altium, sourced components, soldered, and tested for voltage and frequency tolerances

Power Systems Junior Member

Sep. 2024 – Present

University of Toronto Wind Turbine Design Club

Toronto, ON

- Optimized a buck converter to meet competition voltage requirements by creating custom KiCAD PCBs
- Spearheaded a team of four in PCB soldering, teaching techniques and assembling five fully operational boards
- Simulated and validated circuits using LTspice, breadboards, and an Arduino microcontroller

TECHNICAL SKILLS

Languages: Python, C++, C, Assmebly (RISC-V), Verilog, , MATLAB, JavaScript, HTML/CSS, Latex

Libraries/Frameworks: PyTorch, TensorFlow, NumPy, Pandas, Keras, Arduino IDE, Minim, pickle

Hardware Design Tools: LTspice, KiCAD, Altium, FPGA DE1-SoC, Quartus Prime, ModelSim, Matlab, Simulink

Developer Tools: Git, Github, Visual Studio Code, PyCharm, Processing IDE, Source Tree

Design Software: Unity, SOLIDWORKS, Auto CAD, Sketch Up, Canva, figma