William Wong

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Education

University of Illinois Chicago, College of Engineering - Chicago, IL
Master of Science in Computer Engineering - 2027

Purdue University, College of Engineering - West Lafayette, IN
Bachelor of Science in Computer Engineering - 2025

Relevant Coursework: *ASIC Design Lab, Systems And Signals, Artificial Intelligence, Data Structures, Computer Design and Prototyping, Compiler Systems, Object-Oriented Programming with C++, Computer Security, Operating Systems Engineering*

Research Experience - See will-wong.com for a compilation of all my projects/research.

Purdue SoCET - Purdue University **August 2024 - May 2025**
Undergraduate Researcher *West Lafayette, IN*

- Led a team of 3 undergraduate students on the design of a memory subsystem for a Systolic Array, leveraging insights from the Gemmini and RASA papers to accelerate AI computations and optimize design architecture.
- Designed parametric I-Cache, D-Cache, scratchpad, and memory arbiter to be able to handle memory requests for both scalar and matrix operations.
- Synthesized the scratchpad using MITLL's 90 nm Silicon-on-Insulator process and achieved a clock frequency of 696MHz over a 1Ghz clock, demonstrating high throughput.

Projects

CIFAR-10 Image Classifier with PyTorch - My Demo **Spring 2025**

- Created multiple image predictors using different neural network models in order to teach undergraduate students an introduction to neural network applications in practice.
- Organized the procedure to build a CNN to handle images from the CIFAR-10 dataset, achieving a final test accuracy of 90.09%.
- Produced an .ipynb to TSX Python script to convert an interactive coding space like Google Colab or Jupyter into a webpage.

AES-256 Implementation with CTR Mode and X9.31 Extensions - My Demo **Spring 2025**

- Built an AES-256 encryption class in Python, using the Bitvector library, in order to encrypt PPM images and to generate pseudorandom numbers.
- Converted a Python script into a detailed Jupyter notebook with markdown and code cells to showcase the encryption process such as: substituting each byte, shifting a row of bytes, mixing columns with matrix multiplication, and adding the round keys.

Dual Core Pipelined RISC-V Processor **Fall 2024**

- Prototyped modules with RTL designs and an FPGA respectively, that individually controlled the memory caches, datapath, and signals for the processor to handle RISC-V instructions.
- Conducted detailed waveform analyses on system processors, analyzing key metrics such as maximum frequency and CPI for calculations and achieving a 628% speedup in total execution time compared to a single-cycle, non-cached, non-pipelined processor.
- Synthesized and optimized a multicore, pipelined processor by improving module pathways and timing, achieving top 5 performance in frequency and CPI among 200 classmates.

USB AHB-Lite SoC Module **Fall 2023**

- Coordinated version control processes with Git to document the development progress of RX, TX, and AHB-Lite modules for USB data packet parsing and handshaking.
- Developed AHB-Lite bus interface logic to enable efficient register access and DMA-based data transfers between USB endpoints and on-chip memory, reducing CPU overhead by 62%.

Audio Equalizer Project **Fall 2022**

- Designed and prototyped an analog audio equalizer on a breadboard, integrating low-pass, high-pass, and band-pass filters to tune bass (up to 320 Hz), mid (0.32–3.2 kHz), and treble (above 3.2 kHz) frequency bands.
- Implemented low-noise amplifiers (LF356N) and a summing amplifier (LM324) for volume control, achieving 108 mV RMS (+8% increase over expected value of 100mV) output at maximum settings and <15 mV RMS at minimum.

Work Experience

RS Five, LLC **May 2025 - Present**
Community Outreach Subcontractor *Glenview, IL*

- Collaborated within a mentored team to engage community members and guide homeowners through the process of replacing damaged property from severe storms.

Skills

Programming Languages: C, C++, Python, HTML, MATLAB, Flask, JavaScript, System Verilog, LaTeX, TypeScript
Design Skills: Object-Oriented Programming, Digital Circuit Design, RTL Simulation & Verification, Ubuntu, QuestaSim, Cadence