Xinyu Liu

+1 765-409-2393 | liuxinyujames@gmail.com | github.com/xinyuJames | xinyujames.github.io/page

Education

Purdue University, West Lafayette — GPA: 3.91/4.0 (Major), 3.78/4.0 (Cumulative)
Bachelor of Science in Computer Engineering — *Aug. 2023 – May. 2027*

Selected Courses: Computer Organization & Prototyping, Operating System, ASIC Design Lab, Micropro Sys & Intrfac, Data Structures, Signal & System, Probabilistic Method, Python for Data Science.

Computer Skills: C, SystemVerilog, Python, Matlab, Java

Experience

Purdue SoCET AI Hardware Team - DRAM Controller | *DDR4, AMBA AXI* — Jan. 2026 - Now
Purdue University — *West Lafayette, IN*

- Currently Studying DDR4 DRAM system organization, and will implement an AXI bus as main transaction protocol for the AI Hardware design.

Research Assistant - CQEM Lab (VIP) | *Prof. Thomas Roth* — Aug. 2025 – Dec. 2025
Purdue University — *West Lafayette, IN*

- Designed a GUI using PyQt6, which allows users to generate the netlist from components they assembled. The netlist will interact with the backend simulator, and the result will be displayed on the output page.
- Implemented p-refinement in FEM with hierarchical basis functions up to the third order with Gaussian Quadrature. Decreased RMS error compared with first order interpolating basis function in a simulation for eigenvalues.

Teacing Assistant - Advanced C Programming (ECE264) | *Prof. Yung-Hsiang Lu* — Aug. 2025 – Dec. 2025
Purdue University — *West Lafayette, IN*

- Created an assignment "Maze", aiming to find the shortest path from start to end, that requires students' understanding with fileIO, dynamic data structure, and the BFS.
- Held weekly office hours, assisting 200+ students with basic Shell programming, course concepts, debugging, valgrind, and Makefile.

Projects

ASIC Design | *AMBA APB/AHB, FIR-filter, UART, USB* — Aug 2025 – Dec. 2025
Purdue University — *West Lafayette, IN*

- Designed and synthesized a UART Receiver, with an APB subordinate, which allows the manager to set up and read from the receiver.
- Designed and synthesized a 4-Point high-pass FIR filter with programmable coefficients. Implemented an AHB subordinate for manager to load coefficients, and continuously input samples to the filter.
- Designed and synthesized a USB 1.1 with Bulk Transfer type in a group of 3. The device can talk with peripheral through AHB subordinate using Burst Transfer. Transmitting and Receiving implement feature of CRC and Bit Stuffing.

Health Checker | *I2C, SPI, PWM, Timer, DMA* — Aug 2025 – Dec. 2025
Purdue University — *West Lafayette, IN*

- Designed a Health Checker that can measure body temperature, heart-rate, and walking steps, and these are displayed through a VGA screen. The checker will trigger alarm with blinking LED if any of the data is considered unhealthy.
- Used MAX30102 for heart-rate, MAX30205 for body-temperature, and ADXL345 for calculating steps in the design. Assembled into a PCB with RP2350, which is wearable on the wrist.

Audio Equalizer | *Matlab, Butterworth Filter, Op-Amp* — May 2025 – Aug. 2025
Purdue University — *West Lafayette, IN*

- Designed and analyzed second-order bandpass filters centered at 300 Hz, 1 kHz, and 3 kHz with Q = 5, illustrating how center frequency and Q influenced bandwidth and resonance.
- Scaled the filters for unity gain and applied 4th-order Butterworth low-pass, band-pass, and high-pass filters to separate bass, midrange, and treble in an audio signal, then plotted their spectra to visualize the frequency content of each band.
- Used Passive Filters and Inverting, Summing, Power Amplifier to build a Audio Equalizer on the breadboard, which is capable of controlling volumes for different frequencies of a music.