

Education

University of California, San Diego (Double Major)

GPA: 3.84 / 4.0

B.S in Computer Engineering (Major GPA: 3.885 / 4.0)

Expected graduation: Jun. 2023

- **Coursework:** Computer Architecture, Parallel Computing, Operating System, Digital System Design, Circuit Design, Data Mining, Data Structure, Algorithm, Prob & Stats, Signal & System.
- Tau Beta Pi Engineering Honor Society *Elected: Jan. 2021*
- Thurgood Marshall College Honor Program *Elected: Sept. 2021*

B.S in Applied Mathematics (Major GPA: 3.975/4.0)

Expected graduation: Jun. 2023

- **Coursework:** Geometric Computer Graphics, Linear & Nonlinear Optimization, Graph Theory, Combinatorics, Real Analysis, Advanced Linear Algebra, Calculus.

Publication

- Minxuan Zhou*, **Xuan Wang***, Tajana Rosing, “**OverlaPIM**: Overlap Optimization for Processing In-Memory Neural Network Acceleration”, *Design, Automation, and Test in Europe (DATE’2023)*, to appear.
* Co-first authors.

Research Experience

SEE Lab, UC San Diego (Advisor: Prof. Tajana Simunic Rosing)

Apr. 2021- Present

Computer Architecture researcher in System Energy Efficiency Lab, improving model efficiency with process-in-memory (PIM).

- Optimized DNN acceleration framework for in PIM and improving efficiency through fusion and transformation.
- Improved a SOTA framework to evaluate whole DNN model in architecture mappings instead of single layer in C++.
- Developed toolkit in PyTorch to collect parameters for modules in DNN models and analyze modules in topological order for neural network acceleration analysis.
- Explored dataflow based on PIM architecture and mapping to collect exploration results and generate final report.
- Designing and implementing priority-based layer search algorithm for **OverlaPIM**.
- Optimizing **OverlaPIM** framework to improve runtime performance and scalability.

Turakhia Lab, UC San Diego (Advisor: Prof. Yatish Turakhia)

Apr. 2022 - Sept. 2022

Computer Architecture researcher and ASIC design engineering internship.

- Implemented PEs and SRAMs for genomics pairwise sequence alignment acceleration in System Verilog.
- Collected ALUTs resource, registers, and Fmax data by synthesizing on Vivado.

Berg Lab, UC San Diego (Advisor: Prof. Taylor Berg-Kirkpatrick)

Oct. 2020 – Jun. 2021

ML researcher, optimize historical document transcribing quality using convolution networks and gradient decoding algorithm.

- 1 of 48 students chosen for CSE Early Research Scholars Program and earned the highest grade out of 14 research groups on group research proposal.
- Optimized historical document transcription quality using of convolution network and gradient decoding algorithm.
- Implemented BASEDNet, a DNN model with 97% accuracy in Tensorflow and evaluated using the IoU formula.

Project Experience

Trotting Horse Lamp, UC San Diego

Dec.2022

- Animated an OpenGL scene for trotting horse lamp in C++ in course Math155A.
- Implemented keyboard controls to allow mode changes of the scene.

SHA256 and Bitcoin, UC San Diego

Mar.2022

- Implemented SHA256 and Bitcoin cryptography algorithm in System Verilog
- Optimized the system using parallel processing and bit reducing strategies.

Information Theory and Game Wordle, UC San Diego

Mar.2022

- Introduced Information Theory, Entropy, and Game Wordle in Python with mathematical proof and reasoning.
- Implemented Information Theory and Entropy to solve the Game Wordle automatically in Julia.
- Presented introduction and implementation as a 45-minute lecture and scored top percentage in course Math157.

Recipe Management Web and App, UC San Diego

Dec.2021

- Earned top 5 out of 35 groups in the Fall 2021 CSE 110 – Software Engineering.
- Implemented APIs to support front-end functionalities, such as nutrition facts calculation and ingredient displacement.
- Engaged in group efforts to develop functionalities, such as searching recipes, creating user recipes, and grocery lists.

Python Pixel Workshop, Nuevo Foundation

Sept. 2020

- 1 of 13 workshops chosen to be displayed on Nuevo Foundation webpage.
- Designed a Python-Pixel workshop tailored to under-represented students with limited access to programming courses.
- Implemented the workshop in Markdown, covering intro-level concepts related to pixels, color, images, and loops.

Technical Skills

- **Technical Language:** C++, Python, C, Java, Julia, SageMath, System Verilog, Markdown ARM assembly, HTML.
- **Tools and Skills:** OpenGL, Cuda, PyTorch, MATLAB, Vivado, LTspice, LaTeX, Unix/Linux, Git, VS Code, Visual Studio, Bash, GitHub, TensorFlow, Docker, NumPy, Jupyter Notebook.

Honors and Awards

- **Provost Honors:** FA19, WI20, SP20, WI21, SP21, FA21, WI22, SP22.
- Provincial Second Prize in National Chemistry Olympiad (2018).