# Xuan Wang

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## Education

**University of California, San Diego** **GPA: 4.0 / 4.0**

*Ph.D.* in Computer Science and Engineering (Advisor: Prof. Tajana Rosing) *Expected 2027*

**University of California, San Diego (Double Major) (Cum Laude)** **GPA: 3.86 / 4.0**

*B.S* in Computer Engineering (Major GPA: 3.89 / 4.0) *Jun. 2023*

*B.S* in Applied Mathematics (Major GPA: 3.98 / 4.0) *Jun. 2023*

## Publication

- **Xuan Wang***, Minxuan Zhou*, Tajana Rosing, "**Fast-OverlaPIM**: A Fast Overlap-driven Mapping Framework for Processing In-Memory Neural Network Acceleration", *in submission.*
- Behnam Khaleghi, Xiaofan Yu, Jaeyoung Kang, **Xuan Wang**, Tajana Rosing, "Private and Efficient Learning at the Edge with Hyperdimensional Computing", *in submission.*
- Minxuan Zhou*, **Xuan Wang***, Tajana Rosing, "**OverlaPIM**: Overlap Optimization for Processing In-Memory Neural Network Acceleration"*, Design, Automation, and Test in Europe (DATE'2023).*

** Co-first authors.*

## Selected Research Projects

**Domain-Specific Acceleration with Fully Homomorphic Encryption** *(Advised by Prof. Tajana Rosing)* *Oct. 2023- Present*

- Investigating fully homomorphic encryption and hardware simulators for domain-specific acceleration.

**(Fast-)OverlaPIM: Overlap Optimization for PIM NN Acceleration** *(Advised by Prof. Tajana Rosing)* *Apr. 2021- Oct. 2023*

- Developed **OverlaPIM**, a hardware-software co-design DNN mapping framework on PIM, produced **2.10x to 4.11x** faster mappings through input-output computational overlap and transformation in C++ with baseline Timeloop.
- Optimized framework to evaluate whole DNN model in design space instead of a single layer.
- Co-designed between architecture constrains and framework to generate better mapping in **(Fast-)OverlaPIM.**

**Genomics Pairwise Sequence Alignment Acceleration** *(Advised by Prof. Yatish Turakhia)* *Apr.2022 - Sept.2022*

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

**BASEDNet: Baseline Detection for Historical Documents** *(Advised by Prof. Taylor Berg-Kirkpatrick)* *Oct. 2020 – Jun.2021*

- 1 of 49 students chosen for CSE Early Research Scholars.
- Implemented BASEDNet, a DNN model in Tensorflow and evaluated using the IoU formula.

## Technical Skills/Selected Coursework

- **Technical Language**: **C++**, **Python**, **C**, **System Verilog**, Java, **Julia**, SageMath, Markdown, 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.
- **CS Coursework**: **Computer Architecture**, **Parallel Computing**, **Operating System**, **Fully Homormophic Encryption, Digital System Design**, Circuit Design, Artificial Intelligence, Data Mining, Data Structure, Algorithm, Prob & Stats, Signal & System.
- **Mathematics Coursework**: **Linear & Nonlinear Optimization**, **Graph Theory**, **Combinatorics**, Geometric Computer Graphics, Real Analysis, Advanced Linear Algebra, Calculus.

## Honors and Awards

- **TRELS** (Triton Research & Experimental Learning Scholars) Quarterly Awards (WI23)
- **Tau Beta Pi** Engineering Honor Society (2021-present)
- Thurgood Marshall College Honor Program (2021-2023)
- **Provost Honors:** FA19, WI20, SP20, WI21, SP21, FA21, WI22, SP22.
- Provincial Second Prize in National Chemistry Olympiad (2018).