ZIWEN WANG

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https://github.com/deft-gur

Education

- **University of Waterloo** *May 2025 - Current*
  MMath Combinatorics & Optimization, under supervision of Levent Tuncel Waterloo, CA
  - GPA: 99%
- **University of Waterloo** *Sep 2020 - Apr 2025*
  Bachelor of Mathematics (Honors Computer Science and Combinatorics & Optimization) Waterloo, CA
  - GPA: 90%

Research Experience

- **Symbolic Computation Group, University of Waterloo** *May 2024 - Sep 2024 (Full time), Sep 2024 - Aug 2025 (Part Time)*
  URA under supervision of George Labahn and Arne Storjohann Waterloo, CA
  - Studied and comprehended papers on algorithms related to randomized linear algebra on integer matrices, including the Smith and Hermite Normal Forms.
  - Implemented a Las Vegas Algorithm for computing the Smith Normal Form with multipliers and the Hermite Normal Form of an integer nonsingular matrix from a series of recently published papers co-authored by my supervisors.
  - Identified key slow downs and designed better sub-algorithms that resulted in speed up from 12 hours of computation to 5 min for matrices of size in the ten thousands with 20 or 30 integer digits.
  - Lastly, I've reimplemented everything in C for speed 3x speed up which can be find here https://github.com/SmithMassager.
- **Huawei Tech. R&D lab** *May 2022 - Aug 2022, Jan 2023 - Apr 2023, Sep 2023 - Dec 2023*
  AI Compiler assistant engineer Markham, CA
  - Trained a NN model using PyTorch for compiler optimization decisions that resulted in a 4% increase in performance.
  - Investigated the pass ordering problem for innovation project and developed code to automate this process in the LLVM project.
  - Implemented AI Enabled Pass Optimization (ACPO) project interface inside the LLVM compiler.
  - Redesigned feature collection process and interface for ACPO that resulted in 2x speed up in the compilation time.
  - Developed a Function Inlining interface for ACPO invocation that leveraged ML model for decision making and resulted 12% potential speed up compared to traditional heuristic prediction.

Projects And Other Activities

- **VPN project** *May 2025*
  Tools: Xray, Nodejs, Firebase
  - Worked on the development of backend API requests, VPN server setup, frontend proxy setup, and the development of automation scripts.
- **Home server setup** *2021-current*
  Tools: Nix, i3wm, RDP, etc https://github.com/deft-gur/dotfiles
  - Setup a home server for SSH and RDP access. Used Nixos a declarative OS to specify system specification.
  - Linux and open source enthusiast.
  - Setup Moonlight and Sunshine game streaming.

Preprint

- Ashouri, A. H., Manzoor, M. A., Vu, D. M., Zhang, R., Wang, Z., Zhang, A., ... Gao, Y. (2023). *ACPO: AI-Enabled Compiler-Driven Program Optimization.* Submitted to ACM Transactions on Architecture and Code Optimization. Preprint at arXiv:2312.09982.

Teaching Experience

- **TA CO250, Introduction to Optimization** *Sep 2025 - Dec 2025*
- **TA CO456, Introduction to Game Theory** *Sep 2025 - Dec 2025*

Honors and Awards

- **University of Waterloo President's Scholarship of Distinction, $2,000** *2021*
- **Cheriton Undergraduate Research Fellowship, Cheriton School of Computer Science, $7,500** *2024*