

YIFAN ZHAO

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CURRENT RESEARCH

I am a Ph.D. student in Computer Science in the University of Illinois at Urbana-Champaign, co-advised by Prof. Sasa Misailovic and Prof. Vikram Adve.

My research interests include accuracy-aware compilers and autotuning systems for heterogeneous systems. My current and recent research projects include:

ApproxTuner ApproxTuner (published in PPOPP 2021) uses autotuning to find approximation configurations that maximize speedup and/or energy savings of an application, within an end-to-end quality threshold.

In this work, we propose a novel *predictive approximation autotuning* technique using an accuracy predictor, which brings 13x speedup compared to conventional autotuning.

Approximations in Agriculture Robots In this ongoing project, we study the fault-tolerance of a real-world robotics application in the area of digital agriculture. We use an agriculture monitoring robot from Earthsense, which navigates autonomously in farm fields and collects and analyses data of crop status.

For the navigation component, we have evaluated how several DNN pruning mechanisms impact the ability of the robots to maintain their direction and continue operating, and have identified several promising approximation opportunities. Using these approximations to reduce the computational overhead of DNN, we estimate that the hardware cost of the robot can be reduced by 25%.

EDUCATION

University of Illinois at Urbana-Champaign

Champaign, U.S.

Ph.D. Student in Computer Science

Sep. 2019 – Present

University of Michigan

Ann Arbor, U.S.

B.S.E. in Computer Science

Sep. 2017 – Apr. 2019

Graduated with Summa Cum Laude

Shanghai Jiaotong University

Shanghai, China

B.S. in Electrical and Computer Engineering

Sep. 2015 – Aug. 2019

PUBLICATIONS

- **ApproxTuner: A Compiler and Runtime System for Adaptive Approximations.**

Hashim Sharif, **Yifan Zhao**, Maria Kotsifakou, Akash Kothari, Benjamin Schreiber, Elizabeth Wang, Yasmin Sarita, Nathan Zhao, Keyur Joshi, Vikram Adve, Sasa Misailovic, Sarita Adve. *The 26th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming* (PPOPP 2021), Seoul, South Korea.

- **Huron: Hybrid False Sharing Detection and Repair.**

Tanvir Ahmed Khan*, **Yifan Zhao***, Gilles Pokam, Barzan Mozafari, Baris Kasikci. *Programming Language Design and Implementation* (PLDI 2019), Phoenix, AZ, USA.

AWARDS AND HONORS

- James B. Angell Scholarship, Winter 2019
- University of Michigan Dean's List & University Honors (Fall 2017, Winter 2018, Fall 2018, Winter 2019)
- UM-SJTU Joint Institute Dean's List (Fall 2015, Fall 2016)