Ziyi Zhang

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EDUCATION

University of Chicago

Ph.D. in Computer Sciences *July 2022 -*

Advisor: Junchen Jiang

University of Wisconsin, Madison

B.S. in Computer Sciences & B.S. in Mathematics *Sep 2017 - May 2020 & Sep 2021 - May 2022*

Advisors: Shivaram Venkataraman, Dieter van Melkebeek

- GPA Overall: 3.95 / 4.0, with Core GPA (CS/Math Courses): 3.98 / 4.0
- Selected course projects: benchmarking different DBMS tuning methods, accelerating the einsum operator in PyTorch, compiler for a subset of C language, database index manager using B+ tree, adding functionality to xv6 operating system

WORK & RESEARCH EXPERIENCE

System Group, University of Wisconsin - Madison Madison, WI, United States

Research Assistant *Sep 2019 - Sep 2020*

Advisor: Shivaram Venkataraman

- Developed a flexible framework for processing video DNN tasks with $\sim$2500 lines of C++
- Used the framework to perform tasks in video DNN pipelines including object detection and object tracking

ByteDance AI Lab Beijing, China

Research Intern *Sep 2020 - Feb 2021*

Advisor: Bairen Yi, Yibo Zhu

- Designed several strategies for overlapping computation and communication across operators
- Developed high performance DNN operators for model parallelism using CUDA/CUTLASS/NCCL
- Saved up to 30% of the communication time for a single operator in the end-to-end benchmark

ByteDance AML (Applied Machine Learning) Beijing, China / Madison, WI, United States

Research & Engineering Intern *Feb 2021 - Nov 2021*

Advisor: Yibo Zhu, Shivaram Venkataraman

- Research
  - Explored ways to accelerate distributed recommendation system training
  - Formulated the training process as a graph problem and used Metis library to find better parameter placement in asynchronous training
  - Investigated data access improvements such as caching to accelerate synchronous training
- Engineering
  - Incorporated new DNN operators into the recommendation system training framework
  - Built tools for quickly checking correctness of gradients during the training process

MENTORSHIP/TEACHING EXPERIENCE

Programming Contest Team, University of Wisconsin - Madison Madison, WI, United States

Coach, Discussion Leader *Sep 2018 - Present*

- Led discussions on problem sets and topics including graph theory and data structure
- Discussed with different teams about contest strategies
- Set up 3 contests with other coaches and wrote test generators and checkers for the problems
- Attended ICPC World Finals 2019 as a coach

Computer Sciences Dept., University of Wisconsin - Madison Madison, WI, United States

Undergraduate Teaching Assistant in Course "Introduction to Algorithms" *Jan 2019 - May 2019*

- Designed and led group discussions on topics including greedy and dynamic programming

- Held individual help sessions for students to answer their questions on course material and algorithm design

AWARDS

- 2021 ICPC North Central North American Regional Champion (Ranked 1st out of 96 teams regionwide)
- 2021 UW Madison CS Dept. Scholarship in Excellence in Competitive Programming
- 2020 ICPC World Finalist (Ranked 17th out of 118 teams worldwide)
- 2019 ICPC North Central North American Regional Champion (Ranked 1st out of 180 teams regionwide)
- 2019 UW Madison CS Dept. Golden Brick Awards
- Dean's List on Fall 2018 and Fall 2019

SELECTED COURSEWORK

- Graduate CS: Big Data Systems, High-Performance Computing, Advanced Algorithms
- Undergraduate CS: Operating Systems, Networks, Databases, Compilers, Algorithms, Artificial Intelligence, Security
- Undergraduate Math: Stochastic Process, Combinatorics, Numerical Analysis, Abstract Algebra, Analysis
- Coursera Online Course: Neural Networks and Deep Learning, Convolutional Neural Networks, Recurrent Neural Networks

SKILLS

Engineering

- **Programming Languages** - C/C++, Python, Java, SQL
- **Framework** - CUDA, PyTorch, TensorFlow, MPI, Spark
- **Development** - CMake, Docker, Git, Linux

General

- **Language Skills** - Mandarin (Primary Language), English (Fluent)