

# Yinwei Dai

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## EDUCATION

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### Princeton University

*Doctor of Philosophy in Computer Science*

- Advisor: Ravi Netravali

Princeton, NJ

*Aug. 2022 - Present*

### University of Michigan

*Master of Science in Engineering in Computer Science*

- Advisor: Mosharaf Chowdhury & Harsha Madhyastha

Ann Arbor, MI

*Sep. 2020 - May. 2022*

*Bachelor of Science in Engineering in Computer Science*

*Sep. 2018 - May. 2020*

### Shanghai Jiao Tong University

*Bachelor of Science in Electrical and Computer Engineering*

Shanghai, China

*Aug. 2016 - Aug. 2020*

## PUBLICATIONS & DRAFTS

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- [NSDI 23] **ModelKeeper: Accelerating DNN Training via Automated Model Transformation** Fan Lai, [Yinwei Dai](#), Harsha Madhyastha, Mosharaf Chowdhury
- [ICML 22] **FedScale: Benchmarking Model and System Performance of Federated Learning** Fan Lai, [Yinwei Dai](#), Xiangfeng Zhu, Harsha Madhyastha, Mosharaf Chowdhury  
Short Version at SOSP ResilientFL, 2021 **Best Paper Award**

## RESEARCH EXPERIENCE

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### University of Michigan, EECS, SymbioticLab

Advised by Prof. Mosharaf Chowdhury and Prof. Harsha V. Madhyastha

Ann Arbor, MI

*July. 2020 - July. 2022*

#### **FedScale: Benchmarking Model and System Performance of Federated Learning**

- Codeveloped an open-sourced benchmark for FL that incorporates real-world client datasets for diverse tasks and supports the simulation of practical FL across millions of clients.
- Collected datasets across tasks and partitioned the raw data with unique client identification
- Implemented baselines for vision tasks under federated learning settings and performed in-depth benchmark experiments for recent FL efforts.

#### **ModelKeeper: Accelerating DNN Training via Automated Model Transformation**

- Codeveloped a model service framework to accelerate DNN training by reducing the computation needed via automated model transformation.
- Developed a graph matching algorithm to measure the transferability between models
- Designed a training scheduler to prioritize training jobs with high model transferability
- Improved model training time performance by 1.5X on Imgclsmob and 3.2X on NASBench201 compared to random initialization.

### University of Michigan, EECS, FAIL

Advised by Prof. David Fouhey

Ann Arbor, MI

*May. 2020 - Dec. 2021*

#### **Visual Relation Detection between Hands and Objects**

- Developed a positional encoding based relation recognition system to capture the pairwise spatial relationship between hands and objects.

## PROJECTS

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- 2-way superscalar P6 processor, Computer Architecture** *Jan. 2022 - May. 2022*
- Implemented P6-structure pipeline to handle RISC-V instructions with 2-way super-scalar, associative no-blocking cache, prefetching and so on.
- Paxos-based Key/Value Service, Distributed Systems** *Sep. 2021 - Dec. 2021*
- Implemented Paxos and designed a key/value service that was fault-tolerant based on Paxos.
- Test Input Generator, Programming Language** *Jan. 2021 - May. 2021*
- Developed an input generator that can maximize branch coverage for a given C file.
- Decaf Compiler, Compiler Construction** *Jan. 2019 - May. 2019*
- Developed a compiler for Decaf from lexical analysis to assembly code generation.

## TEACHING EXPERIENCE

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- University of Michigan, EECS** *Ann Arbor, MI*
- Graduate Student Instructor* EECS442 Computer Vision *Jan. 2022 - May. 2022*
- Graduate Student Instructor* EECS489 Computer Networks *Sep. 2021 - Dec. 2021*
- Grader* EECS545 Machine Learning *Sep. 2019 - Dec. 2019*
- Grader* EECS504 Foundation of Computer Vision *Sep. 2019 - Dec. 2019*
- Grader* EECS445 Introduction to Machine Learning *Jan. 2019 - May. 2019*

## HONORS & AWARDS

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- Participation Grant *ICML, 2022*
- Best Paper Award *SOSP ResilientFL, 2021*
- JI John Wu and Jane Sun Talent Scholarships (5 among 315) *SJTU, 2017*

## SERVICE

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- Program Committee: NeurIPS (Datasets and Benchmarks) 2022
- Artifact Evaluation Committee: SIGCOMM 2022