

Chenxi Yang

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Education

The University of Texas at Austin

PhD in Computer Science, advised by [Prof. Swarat Chaudhuri](#)

Aug 2019 – May 2025 (expected)

Austin, TX

Fudan University

BSc in Computer Science (Honors), advised by [Prof. Yang Chen](#)

Sep 2015 – Jul 2019

Shanghai

- Graduated with Highest Distinction

Work Experience

Google

PhD Intern, [System Research Group](#)

May 2024 – Aug 2024, Seattle, WA

- **Created TPU Scheduling Simulator:** Led the design and implementation of the first lightweight TPU scheduling simulator within Google. Fully replicated existing TPU scheduling algorithms and automated ML training and inference job scheduling on TPUs, providing a rapid solution to explore TPU design spaces. Tested job distribution ideas for *Gemini* serving systems.
- **Optimize TPUs with Machine Learning (ML):** Designed and implemented an ML-based, job-lifetime-aware algorithm to optimize TPU utilization by up to 50%, enhancing user experience.
- **Multi-Model Support:** Provided GBT, MLP, and LLM training and serving support for production and internal workloads at Google.

Student Researcher and PhD Intern, Storage Analytics Team

May 2023 – Jan 2024, Remote and Sunnyvale, CA

- **Created a New ML-driven Storage Approach:** Led the design and implementation of the first ML-driven, cross-layer storage placement solution in warehouse-scale computers.
- **Workloads Scale & Enhanced Performance:** Enabled the data placement for files from over 500 Google Cloud clusters and provides a 2.48x total cost of ownership savings compared to existing production solutions — estimated to save \$12 million upon full deployment.
- **Impact:** First-authored a research paper currently under submission. The solution is being rolled out to production.

Goldman Sachs

Summer Analyst, Engineering

Jun 2018 – Aug 2018, Hong Kong

- **Tested High Frequency Trading Systems:** Built a workload generation tool that simulated trading orders flowing through OSI layers to test the new generation ultra-low-latency DMA trading gateway.
- **Impact:** The tool identified critical bugs during the trading system development phase.

Selected Publications

C3: Learning Congestion Controllers with Formal Certificates. [\[Preprint\]](#) C. Yang, D. Saxena, R. Dwivedula, K. Mahajan, S. Chaudhuri, A. Akella.

A Practical Cross-Layer Approach for ML-Driven Storage Placement in Warehouse-Scale Computers. [\[Preprint\]](#) C. Yang, E. Li, M. Maas, M. Uysal, U. Hafeez, A. Merchant, R. McDougall.

Safe Neurosymbolic Learning with Differentiable Symbolic Execution [\[Paper\]](#) C. Yang, S. Chaudhuri. ICLR 2022.

Certiably Robust Reinforcement Learning through Model-Based Abstract Interpretation. [\[Paper\]](#) C. Yang, G. Anderson, S. Chaudhuri. SaTML 2024.

On a Foundation Model for Operating Systems. [\[Paper\]](#) D. Saxena, N. Sharma, D. Kim, R. Dwivedula, J. Chen, C. Yang, S. Ravula, Z. Hu, A. Akella, J. Biswas, S. Chaudhuri, I. Dillig, A. Dimakis, D. Kim, C. Rossbach. Neurips 2023, ML for Systems Workshop.

Improved Modeling of RNA-binding Protein Motifs in An Interpretable Neural Model of RNA Splicing. [\[Paper\]](#) K. Gupta, C. Yang, K. McCue, O. Bastani, P. A. Sharp, C. Burge, A. Solar-Lezama. Genome Biology 25 (1) 23. ICML 2023. **Spotlight** (Computational Biology Workshop)

Adaptive Scheduling for Edge-Assisted DNN Serving. [\[Paper\]](#) J. He, C. Yang, Z. He, G. Baig, L. Qiu. MASS 2023.

Accelerating Mobile Applications at the Network Edge with Software-Programmable FPGAs. [\[Paper\]](#) S. Jiang, D. He, C. Yang, C. Xu, G. Luo, Y. Chen, Y. Liu, J. Jiang. INFOCOM 2018.

For a complete list of my publications, please visit [my website](#) and [my Google Scholar profile](#).

Selected Projects

TPU Scheduling Optimization

May 2024 – Aug 2024

Project lead

Google

- **Created TPU Scheduling Simulator:** Led the creation of Google's first lightweight TPU scheduling simulator, replicating existing scheduling algorithms and automating ML training and inference job scheduling on TPUs. Accelerated exploration of TPU design spaces and tested job distribution strategies for large language model (LLM) serving systems.
- **Enhanced TPU Utilization with ML:** Designed and implemented an ML-based, job-lifetime-aware algorithm, increasing TPU utilization by up to 50% and improving user experience.
- **Supported Multi-Model Training and Serving:** Enabled GBT, MLP, and LLM training and serving support for production and internal workloads.

ML-Driven Storage Placement in Data Center

May 2023 – Jan 2024

Project lead

Google

- **Pioneered ML-Driven Storage Placement:** Led the design and implementation of the first ML-driven, cross-layer storage placement solution in warehouse-scale computers.
- **Achieved Significant Cost Savings:** Enabled data placement for files from over 500 Google Cloud clusters, resulting in a 2.48x reduction in total cost of ownership compared to existing solutions—estimated to save \$12 million upon full deployment.
- **Impact:** First-authored a research paper under submission; the solution is being deployed in production environments.

From Theory to Practice: Certifiably Performant ML systems

Jul 2020 – Sep 2024

Project lead

UT-Austin

- **C3: Certified Reinforcement Learning for Networked Systems**
 - **Created C3:** Led the design and implementation of the first approach to building ML-controlled systems that integrates learning with formal certification in the loop. C3 defines and certifies key system properties related to performance and robustness.
 - **Performance Improvement:** C3-trained system controllers reduced delay by 78% and yielded better worst-case performance compared to existing methods.
- **DSE: Safe Neurosymbolic Learning with Differentiable Verification**
 - **DSE Algorithm Design:** Developed a pioneering approach for end-to-end, worst-case-safe parameter learning for neural networks within non-differentiable, symbolic programs.
 - **Excellent Safe Performance:** Integrated symbolic execution and stochastic gradient estimators, enabling applications in autonomous driving and critical healthcare.
- **CAROL: Certified Reinforcement Learning**
 - **CAROL Algorithm Design:** Designed the first RL framework with episode-level certifiable adversarial robustness, based on a new combination of model-based learning and abstract interpretation.
 - **Theory and Evaluation:** Provided rigorous theoretical analysis establishing the soundness of CAROL, verified through control benchmarks.

Edge Server DNN Video Processing Acceleration

Aug 2019 – Jun 2020

Project contributor

UT-Austin

- **Developed Batch-Based Deep Neural Network (DNN) Scheduling Algorithm:** Conceived a batching-aware DNN scheduling methodology to enhance edge DNN request management. Designed and implemented collaborative DNN executions at the edge to accelerate processing on commodity hardware.
- **Performance Improvements:** Reduced completion time and improved system capacity by 20%–400% over baselines when serving DNNs. Increased the on-time ratio, enhancing system capacity by more than 22% over Earliest Deadline First (EDF) with batching strategy.

FPGA-Based Edge Computing for Accelerating Mobile Applications

Jul 2017 – Aug 2017

Project contributor

Peking University

- **Developed FPGA-Based Edge Computing Model:** Engineered a prototype that minimizes response time and energy consumption for interactive mobile applications by offloading computation to an FPGA-based edge.
- **Performance Improvements:** Achieved up to 3x/15x faster response times over CPU-based edge/cloud offloading and enhanced energy efficiency by up to 29.5%.

Selected Awards

- PLMW@PLDI Scholarship 2022
- Outstanding Undergraduate Graduate, Shanghai Region 2019
- Honors Student Award, Top Talent Undergraduate Program, Fudan University 2019

Invited Talks & Presentations

Google Cloud & Google Deepmind, Lifetime-aware TPU Scheduling	Aug 2024
Google SRG Annual Event, Lifetime-aware Bin Packing for TPUs	Aug 2024
SaTML 2024, Certifiably Robust Reinforcement Learning through Model-Based Abstract Interpretation	Apr 2024
Google Deepmind, Learning File Placement Policies in Data Processing Pipelines	Aug 2023
Google Cloud, Learning File Placement Policies in Data Processing Pipelines	Aug 2023
MIT, Safe Neurosymbolic Learning with Differentiable Symbolic Execution	Oct 2022
Caltech, Safe Neurosymbolic Learning with Differentiable Symbolic Execution	Jul 2022
ICLR 2022, Safe Neurosymbolic Learning with Differentiable Symbolic Execution	May 2022

Teaching & Service

Artifact Evaluation Committee	ASPLOS 2025 Spring
Reviewer	AIPLANS@Neurips 2021; Neurips 2022, 2023, 2024; ICML 2023, 2024; ICLR 2023, 2024
Teaching Assistant, CS373: Software Engineering	Fall 2019, Spring 2020

Others

- Programming Languages:** Python, C/C++, Java, Matlab, ACL2 ...
- Machine Learning:** PyTorch, TensorFlow, PyTorch Lightning, Keras, Scikit-Learn, ...
- Technical:** Algorithms & Data Structures, Machine Learning Systems (Software & Hardware), Artificial Intelligence, Reinforcement Learning, Formal Verification, ...