Yuan Yao

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Education

University of Southern California, Los Angeles — **California, USA**
Ph.D. in Computer Science (Aug. 2023 - Present) — *GPA: 4.00 / 4.00*

University of Michigan, Ann Arbor — **Michigan, USA**
Ph.D. in Computer Science and Engineering (Aug. 2021 - Aug. 2023) — *GPA: 4.00 / 4.00*
Advised by: *Professor Harsha V. Madhyastha*

University of Michigan, Ann Arbor — **Michigan, USA**
B.Eng. in Computer Science and Engineering (Aug. 2019 - May. 2021) — *GPA: 3.95 / 4.00*

Shanghai Jiao Tong University UM-SJTU Joint Institute — **Shanghai, China**
B.S.E in Electrical and Computer Engineering (Sept. 2017 - Aug. 2021) — *GPA: 3.70 / 4.00*

Skills: C++, Java, Go, Python / Google Cloud, AWS / Linux, Docker, Kubernetes, Flask, TensorFlow / Git, LaTeX

Research Experience

Research Interests: Distributed systems / Networked systems / Cloud computing / Serverless computing

Cost-Effective Support for Cloud-Assisted 3D Printing — **Ann Arbor, MI**
Graduate Student Research Assistant, advised by Prof. Harsha Madhyastha — *Aug. 2021 - Present*

- Developed *Cosmic*, a serverless framework that optimizes cloud-assisted control of 3D printing.
- Leveraged AWS Lambda to reduce idle cost and over-provisioning, cutting computation costs by 2.8× compared to VM-based solutions.
- Applied speculative execution and group partitioning to meet stringent millisecond-level timing requirements, ensuring timely execution across all tested print jobs.
- Co-authored a paper currently under review for NSDI 2025.

Consistency Analysis of Data Usage Purposes in Mobile Apps — **Ann Arbor, MI**
Research Assistant at Real-Time Computing Laboratory, directed by Prof. Kang Shin — *May 2020 - Apr. 2021*

- Captured and analyzed over 2 million data traffic instances from 20,000+ Android apps, identifying inconsistencies in 15% of apps, which led to privacy policy improvements.
- Built a crawler for 1M+ app IDs and a webserver to monitor and analyze the captured data.
- Co-authored a paper accepted by ACM CCS'21.

Connecting high-resolution 3D chromatin organization with epigenomics — **Ann Arbor, MI**
Research Assistant at Liu Lab, directed by Prof. Jie Liu — *Jan. 2020 - Oct. 2021*

- Designed and implemented a data pipeline to collect, preprocess, and impute epigenomic data, incorporating a deep learning model to map epigenomic features to 3D chromatin organization.
- Integrated the pipeline into the Chromosomal Structure And Epigenomics Analyzer (CAESAR), a web system built using Python Flask.
- The system hosts and visualizes data via the Nucleome Browser framework, allowing real-time user interaction for attribution calculation.
- Co-authored a manuscript accepted by Nature Communications.

Publications

- Cosmic: Cost-Effective Support for Cloud-Assisted 3D Printing *(under review)*
  Yuan Yao*, Chuan He, Chinedum Okwudire, Harsha V. Madhyastha*
  2025 USENIX Symposium on Networked Systems Design and Implementation
- Connecting high-resolution 3D chromatin organization with epigenomics [page]
  Fan Feng, ***Yuan Yao****, Xue Qing David Wang, Xiaotian Zhang, Jie Liu*
  2022 Nature Communications
- Consistency Analysis of Data Usage Purposes in Mobile Apps [page] [pdf]
  Duc Bui, ***Yuan Yao****, Jongmin Choi, Junbum Shin, Kang G. Shin*
  2021 ACM SIGSAC Conference on Computer and Communications Security (CCS '21)