Yile (Michael) Gu

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Education

University of Washington, Seattle, WA
Ph.D. in Computer Science and Engineering Sep 2023 - Present
Advisor: Prof. Baris Kasikci
Research Interests: Systems Reliability, Machine Learning Systems

University of Michigan, Ann Arbor, MI
M.S.E. in Computer Science and Engineering, Cumulative GPA: 4.00/4.00 Aug 2021 - May 2023
B.S.E. in Computer Science, Cumulative GPA: 3.96/4.00 Aug 2019 - May 2021
Award: James B. Angell Scholar, EECS Scholar, Dean's List
Coursework: Compiler Construction, Advanced Operating System, Distributed System, Advanced Computer Vision

Shanghai Jiao Tong University, Shanghai, China
B.E. in Electrical and Computer Engineering, Cumulative GPA: 3.82/4.00, Rank: 11/253 Sep 2017 - Aug 2021
Award: Outstanding Graduate, Merit Student, Undergraduate Excellent Scholarship (Top 10%)
Coursework: Programming & Data Structures, Intro to Signals & Systems, Intro to Logic Design, Electronic Circuits

Research Experience

Efes Lab, University of Washington May 2022 - Present
Project: Benchmarking Generative AI Applications on End-User Devices *Supervisor: Prof. Baris Kasikci*

- Proposed a comprehensive benchmarking framework for evaluating GenAI applications under realistic multi-application workloads on resource-constrained consumer devices. Open-sourced at ConsumerBench.
- Built a DAG–based workflow engine to orchestrate heterogeneous GenAI applications (e.g., chatbots, image generation, live captioning), capturing both application-level SLOs and system-level metrics (GPU/CPU utilization, memory bw).
- Revealed key inefficiencies in resource sharing, including starvation under greedy GPU allocation and underutilization under static partitioning, motivating the need for dynamic, SLO-aware scheduling and backend-aware kernel designs.

Project: Efficent and Accurate Application-level Crash-consistency Bug Detection

- Spearheaded the development of an application level crash-consistency bug detection tool to address current issues with sub-optimal testing space. Open-sourced at Pathfinder.
- Leveraged redundancy in programs' update behaviors to build dependency graphs for pruning testing space.
- Developed a Pin tool to trace syscalls & mmap-IOs, and designed an algorithm to test systems with hybrid protocols.
- Assessed the efficacy of the tool on POSIX and persistent-memory applications, leading to 54 new bug discoveries.
- Built an optimized exhaustive testing baseline to demonstrate that our tool can achieve a 32x crash-state reduction.

Symbiotic Lab, University of Michigan Aug 2022 - May 2023
Project: Reducing Energy Bloat in Large Model Training *Supervisor: Prof. Mosharaf Chowdhury*

- Discovered the existence of energy bloat in large model training caused by fundamental computation imbalance, where GPUs waste energy by running unnecessarily faster than the critical path of the computation.
- Represented training schedule as a DAG, and designed a graph cut-based algorithm that exclusively and efficiently enumerates all energy schedules on the "iteration time-energy" Pareto frontier.
- Evaluated on large models including GPT3 that our system reduces energy consumption by up to 28.5% without slowdown in training time, with negligible 6.5-minutes average time for the algorithm. Open-sourced at Perseus.

Work Experience

Amazon, Santa Clara, CA, USA June 2025 – Sep 2025
Applied Scientist Intern *Mentors: Zhen Zhang, Mason Fu*

- Designing and implementing an agentic framework to diagnose and localize bugs in LLM inference engines.

Microsoft Research, Redmond, WA, USA June 2024 – Sep 2024
Research Intern *Mentors: Jonathan Mace, Yifan Xiong*
Project: Agentic Time-Series Anomaly Detection with Autonomous Rule Generation

- Designed and implemented an agentic time-series anomaly detection system that autonomously trains explainable and reproducible rules from time-series data using large language models. Open sourced at Argos.
- Proposed a multi-agent training loop with rule mutation and top-k selection for accurate and efficient rule generation.

- Evaluated Argos on public cloud metric datasets (KPI, Yahoo) and a large internal AI infra dataset, achieving up to 29.3% F_1 score improvement over state-of-the-art systems and 3.0×–34.2× inference time speedups.
- Demonstrated Argos's practicality by detecting real-world incidents (e.g., GPU NCCL hangs) in production cloud monitoring, preventing resource waste and service degradation in time.

ByteDance Ltd, Shanghai, China May 2020 – Aug 2020

Software Engineering Intern *Mentors: Jilong Liu, Dong Li*

- Contributed to a cross-platform mobile application framework with native UI features using C++ and Objective-C.
- Detected and resolved performance bugs in the framework, including a serious memory leak due to circular reference.
- Developed customized components with improved efficiency in rendering logic for mobile application developers.

Professional Service

- **Reviewer:** ICLR 2025
- **Artifact Evaluation Committee:** OSDI 2023, ATC 2023
- **External Reviewer:** SOSP 2023, OSDI 2024, MICRO 2024, SOSP 2024
- **Student Volunteer:** NSF NeTS PI Meeting 2023

Peer-reviewed Publications

[1] Mitigating Application Resource Overload with Targeted Task Cancellation. Yigong Hu, Zeyin Zhang, Yicheng Liu, **Yile Gu**, Shuangyu Lei, Baris Kasikci, Peng Huang. (To Appear) SOSP 2025, Seoul, Republic of Korea, November 2025.

[2] Scalable and Accurate Application-level Crash-Consistency Testing via Representative Testing. **Yile Gu***, Ian Neal*, Jiexiao Xu, Shaun Christopher Lee, Ayman Said, Musa Haydar, Jacob Van Geffen, Rohan Kadekodi, Andrew Quinn, Baris Kasikci. (To Appear) OOPSLA 2025, Singapore, October 2025. https://arxiv.org/abs/2503.01390.

[3] NanoFlow: Towards Optimal Large Language Model Serving Throughput. Kan Zhu, Yufei Gao, Yilong Zhao, Liangyu Zhao, Gefei Zuo, **Yile Gu**, Dedong Xie, Zihao Ye, Keisuke Kamahori, Chien-Yu Lin, Ziren Wang, Stephanie Wang, Arvind Krishnamurthy, Baris Kasikci. OSDI 2025, Boston, MA, USA, July 2025. https://arxiv.org/abs/2408.12757.

[4] Fiddler: CPU-GPU Orchestration for Fast Inference of Mixture-of-Experts Models. Keisuke Kamahori*, Tian Tang*, **Yile Gu**, Kan Zhu, Baris Kasikci. ICLR 2025, Singapore, May 2025. https://arxiv.org/abs/2402.07033.

[5] Perseus: Removing Energy Bloat from Large Model Training. Jae-Won Chung, **Yile Gu**, Insu Jang, Luoxi Meng, Nikhil Bansal, Mosharaf Chowdhury. SOSP 2024, Austin, TX, USA, November 2024. https://doi.org/10.1145/3694715.3695970.

Preprints

[1] ConsumerBench: Benchmarking Generative AI Applications on End-User Devices. **Yile Gu***, Rohan Kadekodi*, Hoang Nguyen, Keisuke Kamahori, Yiyu Liu, Baris Kasikci. https://arxiv.org/abs/2506.17538.

[2] Argos: Agentic Time-Series Anomaly Detection with Autonomous Rule Generation via Large Language Models. **Yile Gu**, Yifan Xiong, Jonathan Mace, Yuting Jiang, Yigong Hu, Baris Kasikci, Peng Cheng. https://arxiv.org/abs/2501.14170.

[3] Tactic: Adaptive Sparse Attention with Clustering and Distribution Fitting for Long-Context LLMs. Kan Zhu*, Tian Tang*, Qinyu Xu*, **Yile Gu**, Zhichen Zeng, Rohan Kadekodi, Liangyu Zhao, Ang Li, Arvind Krishnamurthy, Baris Kasikci. https://arxiv.org/abs/2502.12216.

[4] Semantic Scheduling for LLM Inference. Wenyue Hua*, Dujian Ding*, **Yile Gu**, Yujie Ren, Kai Mei, Minghua Ma, William Yang Wang. https://arxiv.org/abs/2506.12204.

[5] TeleRAG: Efficient Retrieval-Augmented Generation Inference with Lookahead Retrieval. Chien-Yu Lin*, Keisuke Kamahori*, Yiyu Liu, Xiaoxiang Shi, Madhav Kashyap, **Yile Gu**, Rulin Shao, Zihao Ye, Kan Zhu, Stephanie Wang, Arvind Krishnamurthy, Rohan Kadekodi, Luis Ceze, Baris Kasikci. https://arxiv.org/abs/2502.20969.

Teaching

TA of Systems for All, University of Washington	Jan 2025 - Mar 2025
GSI of Foundation of Computer Science, University of Michigan	Jan 2022 – May 2022 & Aug 2022 - Dec 2022
IA of Academic Writing II and Fantasy Literature, UM-SJTU Joint Institute	Feb 2019 - Aug 2019

Awards

Azure GenAI for Science Hub (15K USD)	Jan 2025