Yuanli Wang

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EDUCATION

Boston University Boston, MA

PhD in Computer Science *09/2021 – Present*

- Advisor: Vasiliki Kalavri
- GPA: 3.82/4.0

University of Minnesota, Twin Cities Minneapolis, MN

Master of Science in Computer Science *09/2018 – 05/2021*

- GPA: 3.78/4.0

RESEARCH EXPERIENCE

Self-Managed Stream Processing Systems

Advisor: Prof. Vasiliki Kalavri, Boston University *09/2021 – Present*

- Investigated the design and performance of different open-source KV stores, seeking for candidates for streaming state management backend.
- Conducted an empirical evaluation study of auto-scaling of Cloud-based data stream analytics services and quantified their cost of over-provisioning.
- Designing scheduling algorithms for stream processing jobs in the Cloud to achieve performance objectives within limited resources.

Data Heterogeneity for Performance and Reliability in Federated Learning

Advisor: Prof. Abhishek Chandra, University of Minnesota *03/2020 – 05/2021*

- Designed a scheduling and fault tolerance policy for federated learning on heterogeneous edge environments
- Implemented a distributed federated learning system on top of PyTorch with the proposed policy. Reduced training time by 50% without the loss of accuracy.

A Programming Framework for Building Fail-Slow Tolerant Distributed Systems

Advisor: Prof. Shuai Mu, Stony Brook University and Prof. Tianyin Xu, UIUC *06/2020 – 03/2021*

- Built benchmark tools and tested the performance of different Raft based open-source distributed databases under fail-slow failures.
- Investigated the root cause of the performance degradation of TiDB when dealing with fail-slow failures. Reported the bugs to developers.

PUBLICATIONS

- **Yuanli Wang**, Baiqing Lyu, Vasiliki Kalavri. The *Non-Expert Tax*: Quantifying the cost of auto-scaling in Cloud-based data stream analytics. International Workshop on Big Data in Emergent Distributed Environments (BiDEDE 2022). 2022
- Esmail Asyabi, **Yuanli Wang**, John Liagouris, Vasiliki Kalavri, Azer Bestavros. A New Benchmark Harness for Systematic and Robust Evaluation of Streaming State Stores. Proceedings of the Seventeenth European Conference on Computer Systems (EuroSys 2022). 2022
- Joel Wolfrath, Nikhil Sreekumar, Dhruv Kumar, **Yuanli Wang**, Abhishek Chandra. HACCS: Heterogeneity-Aware Clustered Client Selection for Accelerated Federated Learning. 36th IEEE International Parallel and Distributed Processing Symposium (IPDPS 2022). 2022
- **Yuanli Wang**, Joel Wolfrath, Nikhil Sreekumar, Dhruv Kumar, Abhishek Chandra. Accelerated Training via Device Similarity in Federated Learning. The 4th International Workshop on Edge Systems, Analytics and Networking (EdgeSys 2021). 2021
- Andrew Yoo, **Yuanli Wang**, Ritesh Sinha, Shuai Mu, Tianyin Xu. Fail-slow fault tolerance needs programming support. The 18th Workshop on Hot Topics in Operating Systems (HotOS XVIII). 2021
- **Yuanli Wang**, Dhruv Kumar, Abhishek Chandra. Exploiting Data Heterogeneity for Performance and Reliability in Federated Learning. Poster in the Fifth ACM/IEEE Symposium on Edge Computing. 2020

PROFESSIONAL SERVICE

- **Program Committee:** EuroSys 2022 (Shadow PC), IMC 2022 (Shadow PC)
- **Artifact Evaluation Committee:** SOSP 2021, SIGCOMM 2021

SKILLS

Programming: C++, Python, Java, Go, Rust, Shell, SQL, Docker, Git, Flink, Beam, Kafka, RocksDB
Cloud infrastructures: AWS, Google Cloud, Microsoft Azure

INVITED TALKS

Towards a cost-efficient and QoS-aware self-managed stream processing system
- Meta 07/2022

PROFESSIONAL EXPERIENCE

PingCAP | *Database Engineer Intern* 05/2019 – 08/2019

- Worked on AutoTiKV project from scratch: used machine learning to tune a database system under user-specific workloads.
- Implemented a Gaussian Process Regression Model to predict the performance of RocksDB(the core storage engine in TiKV) under different knob configurations. Achieved 1.3x lower latency under several types of workloads without human guidance.

TEACHING

Teaching Fellow, CAS CS 210 Computer Systems, Boston University Fall 2022
Teaching Assistant, CSCI 5105 Distributed Systems, University of Minnesota Spring 2021
Teaching Assistant, CSCI 5103 Operating Systems, University of Minnesota Fall 2020

SELECTED AWARDS

Conference Student Grant: NSDI'21, OSDI'21
Selected entrant for 2019 Google Machine Learning Winter Camp (100 participants nationwide) 01/2019
Rank 16/183 in 2018 ACM-ICPC North Central North America Regional Contest 11/2018
Bronze Medal, China Collegiate Programming Contest 10/2015