DARBY HUYE

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EDUCATION

PhD Tufts University, Computer Science — Jan 2021 - Present
Advisor: Raja Sambasivan

MS Tufts University, Computer Science — Jan 2021
Advisor: Raja Sambasivan

BS Tufts University, Computer Science & Mathematics — May 2020
Advisors: Ming Chow & Misha Kilmer

RESEARCH INTERESTS

Distributed Systems, Visualization, Performance Debugging, Cloud

RESEARCH EXPERIENCE

Meta, New York City, NY — Ongoing
Research Intern, Mentor: Yuri Shkuro

- Characterizing Meta's microservice architecture by measuring the scale & complexity of their services and how request workflows traverse the system
- Investigating the quality of their distributed tracing data and the implications of inaccuracies

Tufts University, Medford, MA
Advisor: Raja Sambasivan

- **Trace abstractions for performance debugging** — Ongoing
  - Identifying emergent communication patterns in distributed traces using graph mining algorithms
  - Using the frequent emergent patterns as a basis for aggregate performance analysis
- **Understanding microservice architectures**: — 2021-2022
  - Interviewed industry practitioners to understand their perceptions of microservices
  - Analyzed academic microservice testbeds to uncover design decisions and implications
  - Highlighted mismatches between the academic testbeds' limited design space with the vast space of design decisions made industry
- **Experiments with academic microservice testbeds** — 2020
  - Investigated the complexity DeathStarBench's architecture using distributed tracing

- Found that traces collected via the provided HTTP workload generators were mostly homogeneous and did not capture the complete and expected functionality of the application

TEACHING & MENTORSHIP

MIT Primes Mentor 2021 – Present

- Advise high school students in computer science research

Students Advised

Anshul Rastogi & Joey Dong, "Locating Regions of Uncertainty in Distributed Systems using Aggregate Trace Data," 2022

Anshul Rastogi & Tanmay Gupta, "Threshold-Based Inference of Dependencies in Distributed Systems," 2021

PUBLICATIONS

Journal Publications

Huye, D.*, Seshagiri, V.*, Lan, L., Wildani, A., and Sambasivan, R., "Identifying mismatches between microservices testbeds and industrial perceptions of microservices," Journal of Systems Research, vol. 2, no. 1, 2022. DOI: https://doi.org/10.5070/SR32157839 *Contributed Equally

Toslali, M., Ates, E., Huye, D., Zhang, Z., Liu, L., Puterman, S., Coskun, A., Sambasivan, R., "VAIF: Variance-based Automated Instrumentation Framework," Operating Systems Review, vol. 56, no. 1, 2022, pp. 42-50. DOI: https://doi.org/10.1145/3544497.3544504

Conference Papers

Toslali, M., Ates, E., Ellis, A., Zhang, Z., Huye, D Liu, L., Puterman, S., Coskun, A., Sambasivan, R., "Automating instrumentation choices for performance problems in distributed applications with VAIF," Proceedings of the 12th ACM Symposium on Cloud Computing (SoCC'21). November 1st to November 3rd, 2021. DOI: https://doi.org/10.1145/3472883.3487000

TALKS

Research Presentation, "Identifying mismatches between microservice testbeds and industrial perceptions of microservices," Distributed Systems & Networks Group at Tufts University. April 2022.

Guest Lecture, "Performance Debugging on Microservices with Distributed Tracing" in Debugging Cloud Computing at Tufts University. December 2021.

Research Presentation, "LeitMotif: a tool for discovering emergent communication patterns in microservice applications," to industry folks from RedHat, Meta, and Grafana. November 2021.

PROFESSIONAL AFFILIATIONS

ACM, 2021-Present