Muhammed Uluyol

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Education

Ph.D. Computer Science, University of Michigan, Ann Arbor *2022*
Advisor: Prof. Harsha V. Madhyastha
Thesis: "Predictable Performance and Low Cost for Geo-Distributed Applications"

B.S. Computer Science & Mathematics, University of Minnesota, Twin Cities *2015*

Work Experience

University of Michigan, *Research Assistant* *Sep 2015–Apr 2022*

- Developed new designs for cross-data center storage systems and wide area networks that offer near-optimal tradeoffs between predictable performance and low cost.

Google, *Software Engineering Intern* *Jan 2019–Feb 2020, May 2021–Aug 2021*

- Teams: Traffic Engineering, Bandwidth Enforcer
- Proposed a software-defined WAN architecture that offers strong isolation guarantees between cloud tenants.
- Evaluated WAN architecture using a combination of discrete-event simulation and testbed experiments.

Nutanix, *Member of Technical Staff Intern* *May–Dec 2018*

- Outlined an inter-data center storage strategy and replication library for upcoming storage offerings.

Google, *Software Engineering Intern* *May–Aug 2014, Jun–Aug 2015*

- Teams: Kubernetes, Gmail (Site Reliability)
- Launched support for experimental APIs in Kubernetes to unblock feature work.

University of Minnesota, *Research Assistant* *Nov 2012–Aug 2013, Sep 2014–May 2015*

Adventium Labs, Minneapolis, MN, *Intern* *May–Aug 2012, Sep 2013–May 2014*

Research Experience

HEYP: Highly available bandwidth guarantees on highly utilized cloud WANs *2018–2022*

- Wide area networks (WANs) are a scarce but vitial resource for geo-distributed applications.
- For efficiency, state-of-the-art WANs reconfigure the network as demands change, but since this takes time, cloud tenants may be short on bandwidth for several minutes. HEYP (under submission, SIGCOMM'22) guarantees each tenant a baseline level of bandwidth while also maintaining the efficiency of current WANs.

Pando: Near-optimal latency–cost tradeoffs in geo-distributed storage *2017–2020*

- Showed that global web services incur unnecessary latency and cost to access data with strong consistency.
- Existing approaches suffer because they conflate multiple concerns (e.g. the detection and recovery of conflicting data). Pando (NSDI'20) separates these to achieve near-optimal performance across many workloads.

Skills

Go · C++ · Python · Bash · Basic iptables/tc

Honors and Awards

- Outstanding Graduate Student Instructor 2021
- IRTF Applied Networking Research Prize 2018
- NSF Graduate Fellowship Honorable Mention 2016
- University of Michigan Computer Science & Engineering Full First-Year Fellowship 2015–2016
- University of Minnesota College of Science & Engineering Scholarship 2014
- Microsoft Coding Challenge Event First-Place Winner 2014
- CRA Outstanding Undergraduate Award Honorable Mention 2014