

Alisha Ukani

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Education

- 2020 – Present **Ph.D. in Computer Science**, *University of California San Diego*, San Diego, CA
Advisor: Alex C. Snoeren. GPA: 4.0
- 2016 – 2020 **A.B. in Computer Science**, *Harvard University*, Cambridge, MA
Graduated with honors and cum laude in field. GPA: 3.81

Papers

Refereed Papers

- [1] **A. Ukani**, A. Mirian, A.C. Snoeren, “Locked-In during Lock-Down: Undergraduate Life on the Internet in a Pandemic.” Proceedings of the ACM Internet Measurement Conference (IMC) 2021. 24% acceptance rate

In-Progress Papers

- [2] A. Randall, P. Snyder, **A. Ukani**, A.C. Snoeren, G. Voelker, S. Savage, A. Schulman, “Trackers Bounce Back: Measuring Evasion of Partitioned Storage in the Wild” (In Submission)
- [1] J. Larisch, E. Liu, S. Herwig, **A. Ukani**, E. Kohler, J. Mickens, “Juice: A Sticky Serverless Architecture for Stateful Applications” (In Preparation)

Research Experience

- August 2020 – Present **Graduate Researcher**, *UC San Diego*
- Analyzed network flows to understand how COVID-19 changed students’ Internet usage
 - Developed network signatures for social media applications (Facebook, Instagram, and TikTok) and gaming platforms (Steam and Nintendo Switch)
 - Created an algorithm to determine if a user is a domestic or international student based on their network traffic
 - Wrote a paper on the findings, which was accepted to IMC
- September 2018 – May 2021 **Research Assistant to Eddie Kohler and James Mickens on Juice**, *Harvard University*, Cambridge, MA
- Virtualizing the managed runtime interface to create a stateful, secure, and lightweight VM with fast snapshot/restore functionality
 - Developed an addressing protocol for VMs so they can communicate during migration to different physical machines across data centers
 - Modified the Lua runtime to maintain and quickly snapshot/restore file system state
 - Built IoT platform applications using Juice and using traditional architectures
 - Evaluated IoT applications’ HTTP request latency, CPU usage, and memory usage

December 2018 – **Research Assistant to James Mickens on Third Eye**, *Harvard University*,
May 2020 Cambridge, MA

- Discovered vulnerabilities in browser extension sandboxing, allowing extensions unauthorized access to privileged hardware resources; created six variations of the attack
- Implemented defenses to each attack variation and tested its performance and functionality impact on browsers

Industry Experience

June 2021 – **Research Intern**, *Google*, San Diego, CA

- September 2021
- Determined a signal to detect network availability anomalies that are otherwise undetected; this signal is being incorporated into a new anomaly detection system
 - Analyzed data from an internal tool that detects outages and reroutes traffic; used this data to classify events as network black holes or congestion
 - Discovered network congestion created by the internal tool and proposed a solution to continue increasing availability without adding congestion

May 2019 – **Software Engineering Intern**, *Google*, Cambridge, MA

- August 2019
- Completed migration for Google Search infrastructure by isolating dependencies for 3 core “plugins” written by feature developers, which involved creating new APIs based on 25+ code packages
 - Reduced build/deploy latency and increased code readability
 - Tracked and reported migration process by integrating tooling to produce a live-updating graph of the number of plugins needed to be converted
 - Removed legacy infrastructure after completing migration
 - Awarded two Peer Bonus Awards for providing extra assistance to feature developers
 - Started building a tool to automatically detect BGP security attacks in real time as a “20% project”

May 2018 – **Software Engineering Intern**, *Slack*, San Francisco, CA

- August 2018
- Re-architected workspace preferences (accessed 120M+ times/minute) from JSON blobs to an Entity/Attribute/Value model
 - Reduced cache invalidation of the workspace object by 100/minute and reduced each workspace’s memory footprint by up to 55 kB
 - Created a sharded database table using Vitess and wrote a backfill script to migrate existing data
 - Developed a script to generate getter functions for each of the 165 preferences
 - Wrote about the project for Slack’s Engineering Blog (tiny.cc/slack-alisha-blog), viewed 7.5k times and featured on highscalability.com
 - Maintained a 2-week streak as one of the top 10 contributors of Hack language code out of 75+ engineers, and 10-week streak as one of the top 20 contributors
 - Fixed two major bugs in Facebook’s Hack language formatter tool, allowing Slack to start using the tool (github.com/facebook/hhvm/pull/8248 and github.com/facebook/hhvm/pull/8277)

Awards and Honors

2022 NSF Graduate Research Fellowship

2021 ARCS Foundation San Diego Fellowship

2021 Invited to join Tau Beta Pi and Eta Kappa Nu engineering honor societies (top 20% of graduate students)

2021 Selected to attend the GREPSEC and NextProf Pathfinder Workshops

- 2021 USENIX Security Diversity Grant
- 2020 Selected to attend the Cornell, Maryland, Max Planck Pre-doctoral Research School
- 2020 Harvard University Certificate of Distinction and Excellence in Teaching
- 2019 Google Peer Bonus Award (x2)
- 2017,2018,2019 Charles J. Paine Scholarship Award Recipient
- 2018 Harvard University Office of Student Life Spirit of Harvard College Award
- 2017 Harvard University Office of Student Life Emerging Leader Award

Invited Talks

“Locked-In during Lock-Down: Undergraduate Life on the Internet in a Pandemic.”

- o UCSD CSE Research Open House: March 2022
- o Stanford Empirical Security Seminar: November 2021
- o Google: September 2021
- o Google PhD Intern Research Conference: July 2021
- o MIT Security Seminar: May 2021

“Third Eye: A Browser Extension Attack to Spy from Webcams and Microphones.”

- o Harvard SpeakSEAS event: April 2019

Teaching Experience

Fall 2019 **TA: Intro to Systems Programming and Machine Organization (CS 61), Harvard University**

- o Received 4.73/5.0 average rating for teaching effectiveness from student evaluations
- o Awarded Certificate of Distinction and Excellence in Teaching
- o Led biweekly discussion sections, held weekly office hours, and graded homeworks and exams
- o Student comments:
 - “Very open and available. Whenever I had a problem conceptually understanding what was going wrong in my code, Alisha would ensure that I thoroughly understand relevant concepts rather than just telling me what was wrong directly, which really helped solidify concepts for me.”
 - “Alisha was another very incredible section leader. She helped make sections more interesting and helped with explaining concepts of the problem set whenever possible.”
 - “She is good at explaining the material and encouraging student participation and independent thinking in section.”

Fall 2018 **TA: Intro to Systems Programming and Machine Organization (CS 61), Harvard University**

- o Received 4.70/5.0 average rating for teaching effectiveness from student evaluations
- o Student comments:
 - “Awesome section. Loved how you always checked to make sure everyone was following along and understanding the material, and you also covered the most pertinent parts that people were interested in. Greatly appreciated.”
 - “Alisha is super kind and patient while debugging!”

Leadership and Experience

- June 2020 – Present **Mentorship Program Co-Chair**, *UCSD Grad Women in Computing (Grad-WIC)*, San Diego, CA
- Managing a mentorship program for graduate students with 145 participants
 - Restarted partnership with a campus coffee shop to provide free coffee for mentorship program participants
 - Matching mentors and mentees, planning social events, and maintaining a Slack Workspace for the program
 - Helped write grant proposals to acquire \$25k in funding
- August 2018 – **Member**, *City of Cambridge Open Data Review Board*, Cambridge, MA
- August 2020
- Advised the City about residents' concerns on publication of open data and privacy concerns
 - First and only student member
- January 2018 – **Senior Technology Director and Senior Staff Writer**, *Harvard Political Review*, Cambridge, MA
- December 2018
- Led a 6-person team. Oversaw development of the first featured article template, a live blog launched for the 2018 U.S. midterm elections, new search functionality, and an automated magazine archive page
 - Redesigned the main website, decreasing the bounce rate by more than 12%
 - Switched hosting providers, cutting costs from \$2,500+/year to \$500/year
 - Created a Data Style Guide tool for writers. Launched data visualization challenges, initiatives, and partnerships