

Arun Dunna

Research Assistant
PhD Student

September 23, 2019

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Research Interests

Networks, network measurement, network security, censorship and censorship circumvention, and digital privacy. Applications and influences of the listed areas to economics, politics, and social behaviors.

Education

University of Massachusetts Amherst

Ph.D. Computer Science

Amherst, MA

May 2019 – May 2021

- Advisor: Phillipa Gill
- Notable Courses: Research Methods for Empirical Computer Science (CS 691DD), Internet Law and Policy (CS 690L), Machine Learning (CS 689)

University of Massachusetts Amherst

M.S. Computer Science

Amherst, MA

May 2018 – May 2020

- Advisor: Phillipa Gill
- Notable Courses: Advanced Algorithms (CS 611), Affective Computing (CS 527), Information Assurance (CS 660), Neural Networks (CS 682), System Defense (CS 590A)

University of Massachusetts Amherst

B.S. Computer Science, Minor: Mathematics

Amherst, MA

Sep. 2016 – May 2018

- Notable Courses: Machine Learning (CS 589), Detecting Interference in Networks (CS 690B), Artificial Intelligence (CS 383), Financial Mathematics (M 537)

Research

Calipr Lab

Advisor: Phillipa Gill

Amherst, MA

Jan. 2017 – Current

- **Demonetized: Looking at the Black-box of YouTube** Jan. 2019 – Current
- **Investigating the Censorship of the IPv6 Web** Jan. 2019 – Current
- **Applying AS Hegemony to Tor** Nov. 2018 – Current
- **China's Tor-Resilient Infrastructure** Aug. 2018 – Aug. 2019
- **Analyzing China's Blocking of Unpublished Tor Bridges** Jan. 2018 – Aug. 2018
- **The Deployment and Performance of Multi-CDNs** Jan. 2017 – Oct. 2018

IIJ Innovation Institute

Advisors: Zachary Bischof, Romain Fontugne

Tokyo, JP

Jun. 2019 – Aug. 2019

- **A Global Analysis of Broadband** Jun. 2019 – Current

Experience

University of Massachusetts Amherst

Amherst, MA

Research Assistant

May 2018 – Current

- Research assistant in Computer Science department under Phillipa Gill to perform research in Calipr Lab, focused in networks, network measurement, security, and censorship. Working on multiple projects, such as “Demonetized” and “China’s Tor-Resilient Infrastructure”.

IIJ Innovation Institute

Tokyo, JP

Research Intern

Jun. 2019 – Aug. 2019

- Research internship in Internet measurement at IIJ in Tokyo, JP. Primary project was “A Global Analysis of Broadband”.

University of Massachusetts Amherst

Amherst, MA

Research Experience for Undergraduates

May 2017 – Sep. 2017

- Awarded stipend from grant to work in Calipr Lab at UMass on network measurement projects, most notably Multi-CDN. Worked on projects throughout the summer, and did key parts of analysis for the final paper.

Aura Political Group

Atlanta, GA

Information Technology Specialist

Aug. 2015 – Aug. 2016

- Developed software and websites for clients. Deployed and managed encrypted communication servers for secure communications between firm and clients.

nMomentum Corporation

Atlanta, GA

DevOps

Jan. 2010 – Current

- Deploy & manage critical network infrastructure (web/storage servers, encrypted file systems, secure remote file synchronization). Develop websites and software for company and its clients.

Skills

- **Languages:** C++, HTML/CSS, Java, JavaScript, LaTeX, Lua, PHP, Python, R, Rust, SQL, Zeek
- **Platforms:** Android, Unix, Web, Windows
- **Specializations:** Censorship systems, cryptography, cybersecurity, Internet law, Internet measurement, machine learning, networking, software/web development, Unix systems

Publications

1. Rachee Singh, **Arun Dunna**, and Phillipa Gill. Characterizing the Deployment and Performance of Multi-CDNs. *ACM Internet Measurement Conference (IMC)*. Boston, MA. Oct. 2018. (**Acceptance rate 23%**)
2. **Arun Dunna**, Ciarán O’Brien, and Phillipa Gill. Analyzing China’s Blocking of Unpublished Tor Bridges. *USENIX Workshop on Free and Open Communications on the Internet (FOCI)*. Baltimore, MD. Aug. 2018. (**Acceptance rate 39%**)

Presentations

- *Analyzing China's Blocking of Unpublished Tor Bridges*
 - FOCI 2018 Presentation – Baltimore, MD (Aug. 2018)
 - CS 690B Course Presentation – Amherst, MA (May 2018)

Posters

- *China's Tor-Resilient Infrastructure*
 - New England Security Day 2019 – Amherst, MA (Mar. 2019)
- *Applying AS Hegemony to Tor*
 - USENIX Security 2019 – Santa Clara, CA (Aug. 2019)

Teaching

- *COMPSCI 197U - Introduction to Unix*
 - Spring 2019 (Jan. 28 – Mar. 6)
- *CICS 191 - CICS First Year Seminar*
 - Fall 2019, six sessions (Sep. 13 – Sep. 27)

Projects

- **Text-Audio Synchronization Engine**, <https://github.com/adunna/tase> *Sep. 2018 – Current*
Scalable and modular synchronization framework designed to associate positions in text with positions in corresponding audio. Primary example is timestamp position in audiobook with word position in ebook. Implemented using DeepSpeech.
- **sCTF**, <https://sctf.io> *Dec. 2014 – Jan. 2018*
Founded online capture-the-flag competition focused on K-12 students. Largest had over 4000 competitors (K-12 and university students, industry professionals), and 56000 problem submissions.
- **STASiS**, <https://adunna.me/stasis-project/> *Oct. 2016*
Situational Analysis System: A tool for automatically monitoring for specific situations, such as a fire or a drunk driver, through visual input (picture or video), machine learning, and statistical analysis, all packaged with a nice front-end. Developed in 36 hours at HackUMass 2016, winner of MITRE Award for Project in Best Interest of Community.

Committee Involvement

- **Shadow PC Member** *May 2019 – Jul. 2019*
ACM Internet Measurement Conference (IMC) 2019
- **Shadow PC Member** *May 2018 – Jul. 2018*
ACM Internet Measurement Conference (IMC) 2018

Community Contributions

- **Computer Science Graduate Student Senator** *Sep. 2019 – Current*
UMass Amherst Graduate Student Senate

Awards

- **ACM SIGCOMM/IMC Shadow TPC Travel Grant** *Jul. 2018*
Association for Computing Machinery
- **Bay State Master's Program Scholarship** *May 2018 – May 2019*
University of Massachusetts Amherst
- **NSF Research Experience for Undergraduates** *May 2017 – Sep. 2017*
National Science Foundation
- **Chancellor's Award Scholarship** *Sep. 2016 – May 2018*
University of Massachusetts Amherst
- **MITRE Award (STASiS)** *Oct. 2016*
HackUMass