

# Arun Dunna

Research Assistant  
PhD Student

November 7, 2019  
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(401) 285-0403

## Research Interests

Networks, network measurement, network security, censorship and censorship circumvention, and digital privacy. Applications and influences of the listed areas to/on 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)

### 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- **Analyzing China's Blocking of Unpublished Tor Bridges** Jan. 2018 – Aug. 2018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*

- **An Analysis of Consumer Broadband in the US** 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 “An Analysis of Consumer Broadband in the US”.

### University of Massachusetts Amherst

Amherst, MA

*Research Experience for Undergraduates*

*May 2017 – Sep. 2017*

- Funded by National Science Foundation (NSF) 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 & Unix-like, Web, Windows
- **Specializations:** Censorship systems, cryptography, cybersecurity, Internet law, Internet measurement, machine learning, networking, software/web development, Unix & Unix-like 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

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

## Posters

- **Applying AS Hegemony to Tor**, *USENIX 2019 (Santa Clara, CA)* Aug. 2019
- **China’s Tor-Resilient Infrastructure**, *NESD 2019 (Amherst, MA)* Mar. 2019

## Teaching

- **COMPSCI 197U: Introduction to Unix**, *UMass CICS* Spring 2020
- **COMPSCI 365: Digital Forensics**, *UMass CICS* Spring 2020
- **CICS 191: First Year Seminar**, *UMass CICS* Fall 2019, seven sessions
- **COMPSCI 197U: Introduction to Unix**, *UMass CICS* Spring 2019

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