Arun Dunna

Research Assistant
PhD Student

May 1, 2019
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Research Interests

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

Education

University of Massachusetts Amherst — Amherst, MA
Ph.D. Computer Science — *May 2019 – May 2021*

- Advisor: Phillipa Gill

University of Massachusetts Amherst — Amherst, MA
M.S. Computer Science — *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 & Pentesting (CS 590A)

University of Massachusetts Amherst — Amherst, MA
B.S. Computer Science, Minor: Mathematics — *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 — Amherst, MA
Advisor: Phillipa Gill — *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 – Current
- **Analyzing China's Blocking of Unpublished Tor Bridges** — Jan. 2018 – Aug. 2018
- **Multi-CDN** — Jan. 2017 – Oct. 2018

IIJ Innovation Institute — Tokyo, JP
Advisor: TBD — *Jun. 2019 – Aug. 2019*

- **Summer 2019 Project TBD** — Dates TBD

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. Projects TBD.

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:** Bro/Zeek, C++, HTML/CSS, Java, JavaScript, LaTeX, Lua, PHP, Python, R, SQL, XML
- **Platforms:** Android, Unix, Windows
- **Specializations:** Censorship systems, cryptography, cybersecurity, 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 (NESD) – Amherst, MA (Mar. 2019)

Teaching

- *COMPSCI 197U - Introduction to Unix*
  - Spring 2019 (Jan. 28 – Mar. 6)

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 2018 – Jul. 2018*
  ACM Internet Measurement Conference (IMC) 2018

Awards

- **Bay State Master's Program Scholarship** *May 2018 – May 2020*
  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