

M. Daniyal Pirwani Dar

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EDUCATION

Stony Brook University

PhD Computer Science

Stony Brook, NY

January 2023 -

The University of Iowa

PhD Computer Science CGPA: 3.76/4.00

Iowa City, IA
September 2019 - December 2022

Coursework: Computer Security, Privacy and Anonymity, Online Advertising and Tracking, Computational Geometry, Formal Methods in Software Engineering

Lahore University of Management Sciences

BS Computer Science CGPA: 3.15/4.00

Lahore, Pakistan

September 2015 – May 2019

SKILLS

- **Languages:** Formal verification languages (Alloy, Electrum, Lustre), Python, C++, C, Java, Go, JavaScript, HTML, CSS, Haskell, SQL, R
- **OS:** Windows, Linux
- **Version Control System:** Git

EXPERIENCE

Research Assistant

The University of Iowa

September 2019 - Present

My interests lie in cellular network security, with a particular interest in 5G/LTE. I'm working on the following:

- Analyzing the embedded SIM (eSIM) OTA profile management protocol for potential security and privacy issues. I work mainly on going over the standard and building testbeds to carry out potential attacks and develop possible defenses.

In the past I've worked internet measurement problems, mainly focusing on:

- Studying the impact of data gathering techniques, through data analytics, machine learning and topic modeling, and exploring possible confounders that bias measurement studies.
- Measuring online censorship, making use of publicly accessible censorship data as well as conducting internet wide crawls.

The study has produced peer-reviewed conference publications in top-tier conferences like WWW.

PROJECTS

Cellular Network Security

Studying the eSIM OTA update protocol for potential security and privacy vulnerabilities.

- Analyzing the specification for network-level vulnerabilities, the cryptographic implementation for potential attacks and formally verifying the properties listed in the specification.
- Developing testbeds for evaluating potential attacks, as well as holistic defenses that defend against these vulnerabilities.

Internet Measurement Methodologies

Studied the impact various crawling tools have on data variations and the resulting inferences.

- Collected data through various crawlers and showed numerous data variations as a result of crawler variations.
- Established that browser/crawler choice significantly impacts collected data due to the underlying engines.

Studied the YouTube recommendation algorithm by conducting stateful parallel crawls.

- Ran multiple stateful parallel crawls to collect YouTube recommendations whilst mimicking real user-browser interaction.
- Used various NLP-techniques (topic modeling) to classify recommended content (LDA, LSA).
- Through applications of our techniques, we were able to establish a lower-bound on the features algorithmic auditors need not consider when studying potential biases in the YouTube recommendation system.

PUBLICATIONS

[Apophanies or Epiphanies? How Crawlers Impact Our Understanding of the Web](#) *The Web Conference (WWW) 2020* (Acceptance rate: 19.4%)

Suleman Ahmed, **Muhammad Daniyal Dar**, Fareed Zaffar, Narseo-Vallina Rodreguez, Rishab Nithyanand

[Extortion or Expansion? An investigation into the costs and consequences of ICANN's gTLD experiments](#) *Passive and Active Measurement Conference (PAM) 2020* (Acceptance rate: 29.2%)

Shahrooz Pouryousef, **Muhammad Daniyal Dar**, Suleman Ahmad, Phillipa Gill, and Rishab Nithyanand