

Dhruv Rauthan

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Research Interests

Software Defined Networking, Network Security

Education

Georgia Institute of Technology, Atlanta Aug. 2023 – Present
Master of Science in Computer Science 4.0 GPA

Birla Institute of Technology and Science Pilani Aug. 2019 – June 2023
Bachelor of Engineering in Computer Science 8.7 CGPA

Research Experience

Real-time Darknet Detection | *Prof. A. Dainotti* [↗](#) Oct. 2023 – Present

- Using FreeBSD's IPFW firewall software to identify dark subnets within an organization network
- Modified IPFW kernel files to include the functionality of addition, lookup and deletion of network prefixes in dynamic rules

Assessing Georgia Tech's Network Vulnerabilities | *Prof. P. Pearce* [↗](#) Oct. 2023 – Dec. 2023

- Conducted Nmap port, service and application version, OS and protocol scans on the university network to identify active open services and known existing vulnerabilities
- Collected data from external Censys scans and compared findings with internal scans

SiegeBreaker2 | *Prof. S. Chakravarty* [↗](#) , *Prof. V. Naik* [↗](#) Feb. 2022 – Aug. 2023

- Designed improvements over an existing SDN decoy routing system which included setting up a SmartNIC on a CDN edge server, utilising the new Encrypted ClientHello and using Docker instances to relay requests between the user and a blocked website
- Developed a custom proxy with stunnel to encrypt and encapsulate TCP segments

Thesis: Covert Channels in SD-WANs | *Prof. S. Schmid* [↗](#) Aug. 2022 – Jan. 2023

- Worked as a research intern at Technische Universität Berlin
- Set up an open-source SD-WAN flexiWAN on AWS and exploited timing differences in branch authentications and tunnel reconfigurations to exchange covert information between hosts in separate LANs

Sugamyata | *Prof. S. Joshi* [↗](#) Jan. 2022 – May 2023

- This project aims to contribute to the work of accessibility education in India
- Involved in preparation of academic and industry surveys to gauge the importance given by professionals to accessibility related topics
- Analyzed data taken from a software engineering course to understand the impact of accessibility education on student outcomes

Evaluation of Cloud Storage on Edge | *Prof. A. Trivedi* [↗](#) , *Prof. V. Naik* [↗](#) Jan. 2022 – Nov. 2022

- Deployed a Cassandra node cluster in a collection of virtual machines using an open-source framework
- Analyzed the effect of changing latency between network links during read/write operations to the database while also varying Cassandra's replication factor and consistency level

Offline Payment Protocol | *Prof. V. Naik* [↗](#) Aug. 2021 – Jan. 2022

- Developed software which enables point-to-point monetary (CBDC) transactions with the use of authorised hardware (TEE) in mobile devices
- Implemented the Registration and Transaction protocols in the Offline Payment System "untrusted" framework through an Android application
- The purpose of the app was to provide an offline payment functionality which allowed users to make transactions even in the absence of the internet, by connecting to a local hotspot

Privacy in SDN based Networks | *Prof. V. Naik* [↗](#) Jan. 2021 – May 2021

- Built software using Apache2 and OpenSSL to circumvent censorship agencies' firewalls by using ESNI and the concept of domain hiding
- Set up a proxy website on an Apache2 server used to relay requests between the user and a blacklisted domain

Professional Experience

Software Intern May 2022 – July 2022
 NVIDIA [↗](#) Pune, India

- Part of the CUDA Profiling Tools Interface (CUPTI) software team
- Conducted in-depth analysis of CUPTI performance, effectively identifying and enhancing areas of overhead within each Activity API
- Configured scripts to automate the initiation of Docker containers, streamlining the testing process for CUPTI overhead

Summer Intern June 2021 – July 2021
 Village Book Builders [↗](#) USA

- Customized open-source and proprietary software including a Google Meet bot to record meetings automatically
- Discovered ways to remotely manage hundreds of computers using SSH and Powershell
- Leveraged 3rd party APIs such as Microsoft Azure for live speech translation to bridge language barriers

Android Developer Apr. 2020 – Aug. 2020
 Indiahaat [↗](#) Delhi, India

- Created the alpha build of the Android app from scratch for an e-commerce startup; implemented core functionalities such as user authentication, search capabilities, order processing, secure payment handling, and user account management
- Worked with Android development tools including Kotlin, Retrofit2, MVVM architecture, Google Maps APIs and databases using Room

Teaching Experience

Graduate Teaching Assistant Jan. 2024 – Present
 CS 3251 Computer Networking

First Degree Teaching Assistant Jan. 2023 – May 2023
 CS F364 Design and Analysis of Algorithms

First Degree Course Mentor Sep. 2022 – Dec. 2022
 CS F314 Software Development for Portable Devices

Volunteer Experience

Project Lamani | *Teacher*

Took part in an initiative of Abhigyaan, a volunteer organization, and taught under-privileged primary school children in slums

Technical Skills

Languages: Java, C, C++, Python

Networking: Mininet, OpenFlow, OpenvSwitch, OpenSSL, Apache2 Server, OpenVPN, stunnel

Developer Tools: Git, Docker, Android Studio, VS Code, Apache Cassandra, GNS3, AWS

Publications

P. Loganathan*, **D. Rauthan***, A. Trivedi and V. Naik, "Performance Measurement of Distributed Storage on Edge Devices" 2023 15th International Conference on COMmunication Systems & NETworkS (COMSNETS), Bangalore, India, 2023, pp. 841-846, doi: 10.1109/COMSNETS56262.2023.10041319 (* Equal contribution)

Awards

Research Scholarship Assistance | *Alumni Relations Cell* [↗](#)

2023

One of the three awardees of the scholarship for publishing an excellent research paper in a journal/conference. The applicants go through 2 rounds of screening to select the final awardees.