Siddharth Dongre

+1 (585) 404-8870 | sd4767@g.rit.edu | https://sdongre.com

Executive Summary

I am a Ph. D. candidate in Electrical and Computer Engineering at Rochester Institute of Technology (RIT). My research in wireless communications is focused on developing fair, robust and secure spectrum sharing techniques for 5G networks as they coexist with competing protocols, such as Wi-Fi, and incumbent services, such as radio astronomy systems. My lightweight solutions facilitate concurrent operation of coexisting wireless systems while limiting unintended interference and mitigating adversarial attacks. My work has been published in multiple peer-reviewed venues including the top-ranked IEEE Transactions on Information Forensics and Security. I aim to develop an interoperable coexistence framework for seamless and secure wireless coexistence with both terrestrial and non-terrestrial communications.

Educational Details

Ph.D. in Electrical and Computer Engineering **August 2020 – May 2026**
Rochester Institute of Technology, Rochester, New York, USA

MS in Computing Security **August 2017 – May 2020**
Rochester Institute of Technology, Rochester, New York, USA – **GPA 3.9**

Bachelor of Engineering in Computer Engineering **July 2013 – July 2017**
Pune University, India

Journal Articles

- **Siddharth Dongre** and Hanif Rahbari, "Fair and Secure 5G and Wi-Fi Coexistence Using Robust Implicit Channel Coordination," *IEEE Transactions on Information Forensics and Security (TIFS)*, vol. 19, pp. 6679-6692, 2024.
- **Siddharth Dongre**, Tiep M. Hoang, Hanif Rahbari and Alireza Vahid, "Robust and Practical 3D RFI Nulling for 5G and Radio Astronomy Coexistence," *IEEE Transaction on Cognitive Communications and Networking (TCCN)*, vol. 12, pp. 2051-2063, 2025.

Conference Papers

- **Siddharth Dongre**, Tiep M. Hoang, Hanif Rahbari and Alireza Vahid, "Low-latency RFI Nulling and Multi-user Scaling for 5G and Radio Astronomy Coexistence," *IEEE Consumer Communications & Networking Conf*erence, Las Vegas, US, January 10 – 13, 2025, pp. 1–6.
- **Siddharth Dongre** and Hanif Rahbari, "Implicit Channel Coordination to Tackle Starvation Attacks in 5G and Wi-Fi Coexistence Systems," *IEEE Global Communications Conference*, Rio de Janeiro, Brazil, December 4 – 8, 2022, pp. 4136-4141.
- **Siddharth Dongre** and Hanif Rahbari, "Message sieving to mitigate smart gridlock attacks in V2V," *ACM Conference on Security and Privacy in Wireless and Mobile Networks,* Abu Dhabi, UAE, June 28 – July 2, 2021, pp. 129–134.
- **Siddharth Dongre**, Sumita Mishra, Carol Romanowski, Manan Buddhadev, "Towards Quantifying the Cost to Privacy Resulting from Data Breaches," *Thirteenth IFIP WG 11.10 International Conference on Critical Infrastructure Protection SRI International*, Arlington, US March 11-13, 2019, pp. 3–16.

Workshops/Demos/Posters

- **Siddharth Dongre**, Tiep M. Hoang, Hanif Rahbari and Alireza Vahid, "Open-loop NR-U and RAS Coexistence via Beamforming and Interference Nullification," *NSF Catalyzing Coexistence via the National Radio Dynamic Zone,* Green Bank Observatory, US, September 9 – 11, 2024.
- **Siddharth Dongre** and Hanif Rahbari, "Fair and Secure 5G and Wi-Fi Coexistence Using Robust Implicit Channel Coordination," *Great Lakes Security Day*, Rochester Institute of Technology, Rochester, NY, US, April 21, 2023.

Under Review

- **Siddharth Dongre**, Naureen Hoque, Hanif Rahbari, "Adaptive Region-Aware Numerology Optimization for Dynamic High-density NR-V2X Sidelink", *IEEE Conference on Computer Communications*, Tokyo, Japan, May 18–21, 2026. Preprint Available: https://doi.org/10.36227/techrxiv.176620814.49311584/v1

Research Experience

Adaptive Region-Aware Numerology Optimization for NR-V2X Sidelink **January 2024 – Present**

- Description: Implementing a context-aware and region-based numerology optimization method that facilitates large post-quantum resistant safety messages in highly dynamic dense vehicular networks.
- Challenges: Higher numerology values limit support for larger safety messages, while lower values degrade message quality at high speeds. Moreover, numerology adaptation must ensure consistency among vehicles.
- Results: Optimal numerology lookup table and region transition strategies to facilitate large safety messages.

Coexistence of 5G and Radio Astronomy Services (RAS) **August 2023 – July 2025**

- Description: Implementing proactive radio frequency interference nullification directly at the transmitting source 5G base stations to reduce harmful effects on nearby radio astronomy ground telescopes.
- Challenges: passive RAS receivers do not provide wireless channel feedback; nullification needs to be sufficient to allow 5G base station deployment close to RAS while minimizing unintentional negative effects on 5G users; complexity needs to be low to satisfy strict latency requirements of 5G.
- Results: Robust, proactive and low-latency technique nullifies interference at RAS satisfying sensitivity limits.

Implicit Channel Coordination for Wi-Fi and 5G NR-U Coexistence **August 2021 – July 2024**

- Description: Exploiting differences in CSMA mechanisms of 5G and Wi-Fi systems to perform starvation attacks on Wi-Fi nodes, developing an implicit channel coordination (ICC) scheme to mitigate the attack.
- Challenges: Implementing a full 5G and Wi-Fi coexisting environment using USRP devices.
- Results: Attacks reduce Wi-Fi spectrum occupancy to zero, ICC fully mitigates attack.

Message Sieving to Mitigate Smart Gridlock Attacks in V2V **August 2020 – July 2021**

- Description: Mitigating processing bottleneck vulnerabilities in current V2V hardware that can lead to increased likelihood of unsafe outcomes on dense roads.
- Challenges: Identifying malicious BSMs sent by smart attackers and filtering them quickly and reliably.
- Results: Developed a sieving mechanism that filters irrelevant BSMs by 80% accuracy.

Cloning RFID Key-fobs using SDR **August 2018 – December 2018**

- Description: Exploiting vulnerabilities in the implementation of RFID key-fobs using SDR.
- Challenges: Identifying the exact frequencies at which the different key-fobs operate.
- Results: Successfully cloned a key-fob by emulating it using SDR.

Mentorship Experience

Undergraduate Senior-year Project Mentor January 2022 – May 2022

- Mentored students in implementing a 5G and Wi-Fi Coexistence testbed and demonstrated a novel Wi-Fi starvation attack using software-defined radios.

Awarded Grants

Student Grant, RIT Graduate Student Research and Creativity Reimbursement Program - **$330** November 2025
Travel Grant, NSF Calatyzing Coexistence via the National Radio Dynamic Zone – **$1,000** September 2024
Travel Grant, NSF Young Gladiators 2023, Northeastern University – **$500** June 2023
MS Scholarship, Rochester Institute of Technology - **$18,000** 2017-2020

Paper Reviews

Reviewer

IEEE Vehicular Technology Conference (VTC) 2025
IEEE Transactions on Cognitive Communications and Networking (TCCN) 2024

Co-reviewer

IEEE International Conference on Computer Communications (INFOCOM) 2023 – 2025
IEEE/ACM Transactions on Networking (ToN) 2024
IEEE Transactions on Mobile Computing (TMC) 2023
IEEE Transactions on Signal Processing (TSP) 2022

Teaching Experience

Adjunct Instructor – Rating 4.2/5 – Rochester Institute of Technology

CSEC 140 – Introduction to Cybersecurity
January 2026 – May 2026
August 2023 – December 2023
August 2022 – December 2022
August 2021 – December 2021

Graduate Teaching Assistant – Rochester Institute of Technology

CSEC 310 – Endpoint Security — August 2025 – December 2025

CSEC 380 – Principles of Web Application Security — August 2025 – December 2025

CSEC 569/669 – Wireless Security
January 2022 – May 2022
January 2020 – May 2020

CSEC 472 – Authentication and Security Models
January 2023 – May 2023
January 2022 – May 2022

Course Assistant – Rochester Institute of Technology

Introduction to Cybersecurity MicroMasters Course on edX.org
Rochester Institute of Technology
January 2020 – May 2020
August 2019 – December 2019
January 2019 – May 2019
August 2018 – December 2018

Awards/Nominations – Rochester Institute of Technology

Provost Outstanding Graduate Student Teaching Award Nominee — December 2022

Industry Experience

Information Security Analyst Intern – Wegmans Food Markets — **January 2019 – December 2019**

- Incident Response – investigated 11+ critical cyber incidents, improved security controls of Data Protection and Controlled Use of Administrative Privileges.
- Phishing/Malspam – detected and prevented 130+ phishing attacks involving sandboxing of malicious files; identified Emotet malware embedded in PDF file.
- Rule Building – tuned 80+ rules in **IBM QRadar**, improved detection of password spraying attacks.
- Endpoint Detection and Response – Resolved 40+ endpoint security alerts using **Crowdstrike Falcon**.