SUNITHA SAFAVAT

EDUCATION

Doctor of Philosophy in Computer Science   **Expected- Dec 2022**
 Howard University at Washington DC
> *Dissertation title*: "Secure Communications and Content Caching for Internet of Vehicles"
> *Advisor*: Professor Danda B. Rawat

Masters in Information technology   **September 2005- Jan 2008**
Jawaharlal Nehru Technological University-Hyderabad, India

Bachelors in Information technology   **September 2001- June 2005**
Jawaharlal Nehru Technological University-Hyderabad, India

RESEARCH INTERESTS

My primary research interest broadly lies at the intersection of Artificial Intelligence, mobile edge computing, software-defined systems, and Cybersecurity, where I seek to develop new analytical tools for understanding and enhancing the performance of Wireless communication in Internet of Vehicles (IoV) networks and cyber security for Internet of Things (IoT) application.

- Emerging sustainable and intelligent transportation systems, including connected and automated vehicles (CAVs), transportation electrification, mobility-as-a service (MaaS), and active transportation.
- Application of machine learning technique to modeling and control of transportation systems
- Manned and unmanned vehicles and systems
  - *Open-link locomotion modules: open architecture design for optimal vehicle operational properties*
  - *Coupled and interactive dynamics of open architecture vehicle systems*
  - *Connected and autonomous ground and aerial vehicles: morphing dynamics and mobility control in Severe multi-phase environments*
  - *Terrain mobility and energy efficiency of connected unmanned ground vehicles in convoys*
  - *Connectivity and automation for connected vehicle dynamics, powertrain and chassis control*
  - *Cyber-threat protection of vehicle dynamics and systems in connected transportation systems*

I promise to promote diversity, equity and inclusion in computing, and do so through (1) mentoring and outreach, (2) advocacy within my department and student organizations, and (3) increasing awareness about bias and the barriers it creates.

RESEARCH EXPERIENCE

Graduate Research Assistant   **January 2022 - Present**
 Department of Electrical Engineering and Computer Science, Howard University
- Designed and developed AI/ML algorithms for Enhancing Network Capacity, Energy Efficiency and Security for Wireless Internet of Things (IoT) as well as in Internet of Vehicles (IoV).
- Conducted research on different mobile edge computing techniques and applied them to IoT wireless network to improve network throughput and reduce network congestion.
- Collaborate and coordinate with faculty, staff scientists, and fellow graduate students across department.

Graduate Student Researcher   **January 2018 - Present**
 Data Science and Cyber Security Center, Howard University
- Studied the Elliptic Curve Cryptography (ECC) and proposed for Privacy-Aware Secure ACO-AODV Routing in Intent-Based Internet of Vehicles for Smart Cities.
- Conducted research on network attacks and proposed wireless security techniques and applied them to UAV network to improve privacy and security.
- Collaborate and coordinate with faculty, staff scientists, and fellow graduate students across department.

TEACHING AND MENTORING EXPERIENCE

Assistant Professor, Department of Computer Science   **June 2014 – July 2017**
St. Mary's Engineering College - Hyderabad
- Prepared lectures and class activities focusing on the analysis of determinate and indeterminate structures for all level undergraduate students.
- Contributed to creating exams and quizzes for the course, taught review sessions before midterms and finals. Graded written assignments, midterms, and quizzes.
- Recognized as *List of Teachers Ranked Excellent by their Students*.

Graduate Mentor, JNTUH Summer Mentoring Program   **April 2006 – August 2006**
Jawaharlal Nehru Technological University - Hyderabad
- Mentored two undergraduate students in data collection and analysis to visualize various computer network performances metrics during their university level projects.
- Guided the students in preparation and presentation of research findings.

HONORS AND AWARDS

Received one of the most prestigious Scholarship Awarded "National Overseas Scholarship"
Award issued by Government of India to pursue PhD education in foreign countries, it includes full tuition fee and living expenses for 4 years.

PUBLICATIONS

Sunitha Safavat and Danda B. Rawat, "On the Elliptic Curve Cryptography for Privacy-Aware Secure ACO-AODV Routing in Intent-Based Internet of Vehicles for Smart Cities," IEEE Transactions on Intelligent Transportation Systems, Vol. x, No. x, pp. xx -xx, 2020.

Sunitha Safavat, Naveen Naik Sapavath and Danda B. Rawat, "Recent Advances in Mobile Edge Computing and Content Caching," Journal of Digital Communications and Networks, Vol. 6, No. 2, pp: 189-194, May 2020.

Naveen Naik Sapavath, **Sunitha Safavat** and Danda B. Rawat, "On the Machine Learning based Smart Beam-Forming for Wireless Virtualization with Large-Scale MIMO System," Transactions on Emerging Telecommunications Technologies (Wiley), Vol. 30, No. 9, September 2019.

Danda B. Rawat, Chandra Bajracharya, Guy Lingani, **Sunitha Safavat**, "Real-Time Computing, Connectivity and Communications for Secure Mobile Transportation Cyber-Physical Systems," IEEE COMSOC MMTC Communications - Frontiers, Special Issues on Future of the Connected Vehicles, Vol. 14, No. 1, January 2019.

Sunitha Safavat and Danda B. Rawat, "Securing Unmanned Aerial Vehicular Networks Using Modified Elliptic Curve Cryptography," Proc. of the IEEE Military Communications Conference (IEEE MILCOM'2021), 29 November−2 December 2021, San Diego, CA, USA

Sunitha Safavat and Danda B. Rawat, "OptiML: An Enhanced Approach Towards Design of SDN Based UAV Networks," in Proc. of the IEEE International Conference on Communications (IEEE ICC 2022), Seoul, South Korea, May 2022.

CONFERNCE PRESENTATIONS

ORAL PRESENTATIONS

Sunitha Safavat and Danda B. Rawat, "Securing Unmanned Aerial Vehicular Networks Using Modified Elliptic Curve Cryptography," Proc. of the IEEE Military Communications Conference (IEEE MILCOM'2021), 29 November−2 December 2021, San Diego, CA, USA

Sunitha Safavat and Danda B. Rawat, "OptiML: An Enhanced Approach Towards Design of SDN Based UAV Networks," in Proc. of the IEEE International Conference on Communications (IEEE ICC 2022), Seoul, South Korea, May 2022.

PROFESSIONAL EXEPERIENCE

Assistant Professor, Department of Computer Science   **June 2014 – July 2017**
St. Mary's Engineering College - Hyderabad
- Prepared lectures and class activities focusing on the analysis of determinate and indeterminate structures for all level undergraduate students.
- Contributed to creating exams and quizzes for the course, taught review sessions before midterms and finals. Graded written assignments, midterms, and quizzes.
- Recognized as *List of Teachers Ranked Excellent by their Students*.

Database Administrator at Vijetha Publications Private limited.   **July 2008 – August 2010**
Vijetha Publications Private Limited, Hyderabad, India
- Detected, analyzed, and resolved database issues quickly and efficiently ensuring minimal downtimes.
- Created, reviewed, and implemented maintenance plans on production servers.
- Created and maintained documentation for DBA standard operating procedures.

UNIVERSITY SERVICE

Facilitator   **Sep 2005 – July 2008**
Jawaharlal Nehru Technological University - Hyderabad
- Participated in the National Level Student Technical Symposium, where a lot number of students from different college and universities participated to present their experiments.
- Categorized different tracks in the symposium event, where the students from different backgrounds demonstrated their skills and creativity.

TECHNICAL SKILLS

- Programming languages and mathematical packages: Matlab, C, Python (beginner) and SQL.
- Networking Skills: LAN, WAN, TCP/IP, SNS, DHCP and HTTP (S).
- Other Skills: SPSS, Linux (Kali, Ubuntu), Mac OS, and Windows OS

LANGUAGE

English: Proficient
Telugu: Fluent

REFERENCES

Danda B. Rawat, Professor and Dean for Research and Graduate Education
Department of Electrical Engineering and Computer Science,
Howard University,
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Moses Garuba, Professor
Department of Electrical Engineering and Computer Science,
Howard University,
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Chunmei Liu, Professor
Department of Electrical Engineering and Computer Science,
Howard University,
chuliu@howard.edu