

MANVEEN KAUR

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Earned Ph.D. from Clemson University's School of Computing in August 2022. Assistant Professor at California State University Los Angeles in the Computer Science Department since August 2022. Principal Investigator of the Applied Research in Computing Systems (ARCS) lab at Cal State LA researching intelligent communication frameworks, systems, and software for emergent wireless systems; currently advising 15 graduate and undergraduate students on various research projects at the ARCS lab. Teaching courses on Computer Networks, Cybersecurity, Programming Paradigms, and Functional Programming; serving as course co-ordinator for two required undergraduate courses.

EDUCATION

Ph.D., Computer Science, Clemson University, Clemson, SC Aug 2022
Dissertation Title: "SNAP : A Software-Defined & Named-Data Oriented Publish-Subscribe Framework for Emerging Wireless Application Systems"
M.S., Electrical Engineering, Ohio State University, Columbus, OH May 2012
B.Tech., Electrical and Communication Engineering, Rajasthan Technical University, Rajasthan, India May 2010

EDUCATIONAL PERFORMANCE

Assistant Professor, Computer Science Department, California State University Los Angeles *Aug 2022 - present*

• Course Details:

- ***CS 5035 Topics in Functional Programming (Spring 2023, Spring 2025)*** - Study of functional programming and paradigms within it using the Kotlin programming language
- ***CS 3035 Programming Language Paradigms (Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025)*** - Capabilities and styles of various programming languages including imperative, functional, and object-oriented languages.
- ***CS 2470 Fundamentals of Network Systems and Cybersecurity (Fall 2022, Fall 2023, Fall 2024)*** - Study of network communication systems and cybersecurity, including computer network communications, Internet architecture, and Cybersecurity fundamentals such as data security, web security, system security and network security.
- ***CS 5470 Advanced Computer Networks (Spring 2024, Spring 2025)*** - Study of advanced topic in computer networks, including architectures, protocols, and other new technologies applied in computer networks and systems.
- ***CS 4961 and CS 4962 Software Design Lab (Academic Years 2022 - 2023, 2023 - 2024, A2024 - 2025)*** - Senior Design advisor for several project groups each working on a software design and implementation project with industry partners.
- ***CS 5540: Topics in Computer Science - Internet of Things and Cyber-Physical Systems (Summer 2023)*** - Study of emergent concepts in computer networks and systems engineering.

Graduate Teacher of Record, School of Computing, Clemson University, South Carolina *May 2021/22 - July 2021/22*

• Course Details:

- ***CPSC 3600 Networks and Network Programming (Summer, 2021 and Summer, 2022)*** - Introduction to basic concepts of computer network technologies and network programming including network socket programming, layered protocol architectures, local and wide area networks, internetwork and intranetwork concepts, and security.

Graduate Teaching Assistant, School of Computing, Clemson University, South Carolina *Aug 2017 - May 2021*

• Course Details:

- CPSC 8510 (Software Systems for Data Communication), Graduate-level, Fall 2020
- CPSC 3600 (Networks and Network Programming), Undergraduate-level, Spring 2020
- CPSC 8520 (Internetworking), Graduate-level, Spring 2021, Spring 2019
- CPSC 6240 (System Administration and Security), Undergraduate-level, Fall 2018
- CPSC 3950 Honors Seminar, Undergraduate-level, Spring 2018
- CPSC 3990 Advanced Creative Inquiry: CyberTiger Systems, Undergraduate-level, Fall 2017

OTHER EDUCATIONAL ACTIVITIES

- **ABET Course Coordinator (Fall 2024)** - Course coordinator for ABET preparation for 2 undergraduate and 1 graduate course, CS 2470, CS 3035, and CS 5035, respectively.
- **CS Senior Design Co-ordinator (Summer 2024)** - Senior design coordinator supporting selection of senior design projects, discussions with industry partners, student groups to project mapping, and other related tasks.
- **MS Thesis Advisement (Academic Years 2023-2024, 2024-2025)** - Thesis advisor for 1 graduate student in 2023-2024, 2 graduate students in 2024-2025; thesis committee member for several graduate students.
- **BOOST (Summer 2023, Summer 2024, Summer 2025)** - Faculty advisor for the Bridge Opportunities for the Sophomore Transition (BOOST) program at Cal State LA in Summer 2023.
- **LAUNCHPAD (Summer 2023, Summer 2024)** - Faculty mentor for the Launchpad program at Cal State LA offering STEM workshops for high-school students.
- **SMART Summer Internship (Summer 2024)** - Faculty research co-mentor for 6 community college students participating in SMART Summer Internship program at Cal State LA.
- **Faculty Highlight during ECST Week (Spring 2024)** - Participated in the faculty highlight session during ECST week, discussing my academic journey and experiences with participating students.
- **CAHSI LREU Program (Spring 2023)** - Served as the faculty advisor for the CAHSI Local Research Experience for Undergraduates Program in Spring 2023
- **EcoSTEM (Academic Year 2022-2023)** - Served as a part of the EcoSTEM cohort of CSULA in 2022 - 2023
- **New courses** - Proposed and implemented a new course on Cyber-Physical Systems and Internet of Things called the CS 5540: Topics in Computer Science - Internet of Things and Cyber-Physical Systems. Offered in Summer 2023. Expected to be offered in Summer 2025.

PROFESSIONAL ACHIEVEMENTS

Applied Research in Computing Systems (ARCS) lab, Cal State LA

- **Principal Investigator: Real-world deployable intelligent systems (Spring 2025 - present)**
 - **Description:** Design and implementation of distributed communication framework to support AI/ML applications on resource-constrained wireless multi-agent systems such as UAV swarms.
 - **Students involved:** 3 graduate students and 3 undergraduate students.
 - **Funding Source:** New Faculty Startup funds
- **Principal Investigator: Gait identification algorithm for accelerometer-equipped devices (Fall 2025 - Spring 2026)**
 - **Description:** Design, implementation, and testing of a novel gait identification algorithm for accelerometer-equipped mobile devices.
 - **Students involved:** 1 graduate student and 1 undergraduate student
 - **Funding Source:** Office of Research, Scholarship, and Creative Activities at Cal State LA
- **Principal Investigator: Expansion of the Computer Science Supplementary Authorization (CSSA) Program (Scheduled: Fall 2026 - Fall 2027)**
 - **Description:** Planning and implementation of complementary professional development activities designed to enhance the CS practical teaching experience of CSSA cohort.
 - **Students involved:** TBA
 - **Funding Source:** Google Inc. (Google Giving Operations)
- **Principal Investigator: Benchmarking study: Assessing AI/ML capacity of edge systems (Summer 2023 - Fall 2024)**
 - **Description:** Benchmarking study to assess capacity of commodities-based edge devices in supporting AI/ML workloads as a part of multi-agent wireless systems such as UAV swarms.
 - **Students involved:** 2 graduate students and 1 undergraduate student.
 - **Funding Source:** New Faculty Startup funds
 - **Project outcomes:**
 - Publication and Presentation of findings at IEEE Consumer Communication and Networking Conference (CCNC) 2025

- Manuscript on “*A real-world capable intelligent UAV swarm for flood risk assessment using Integrated Sensing and Communication*” under consideration at IEEE ICC 2025 Workshop on Integrated Sensing and Communication 2025.
- **Principal Investigator: Extended benchmarking study: Assessing AI/ML capacity of edge systems (Fall 2025 - present)**
 - **Description:** Large scale study of 10+ AI/ML models with varying computational complexities on 5+ commodities-based edge computing systems. Study uses tools and workflows developed in the prior benchmarking study. Designed to gather large-scale data for better performance insights, and to support students’ interest in volunteering in the ARCS lab.
 - **Students involved:** 10 research volunteers (8 undergraduate students, 2 graduate students)
 - **Funding Source:** None
 - **Project outcome:** Journal paper manuscript by end of Spring 2025.

Collaborations outside Cal State LA

- **Senior Personnel: Network and Compute System Requirements for Ultra-reliable, Low Latency Applications Systems (Fall 2022 - present)**
 - **Description:** Collaborative multi-year project with investigators from Clemson University and MIT Lincoln Labs
 - **Funding Source:** MIT Lincoln Labs
 - Project outcomes:
 - Publications and presentations at IEEE CCNC 2023 and IEEE CCNC 2025
- **Graduate Research Assistant: Uncertainty Quantification of Cyber Attacks on Intelligent Traffic Signals (Summer 2018 - Summer 2019)**
 - **Description:** Evaluation of design modalities that utilize vehicle-to-everything (V2X) communication enabled edge infrastructure to detect cyber-attacks aimed at connected vehicle applications.
 - **Funding Source:** US Department of Transportation
- **Graduate Research Assistant: CPS Synergy: Security of Distributed Cyber-Physical Systems with Connected Vehicle Applications (Fall 2016 - Fall 2018)**
 - **Description:** Development of cyber-attack detection and control countermeasure methodologies for distributed network and computation systems supporting connected vehicle applications.
 - **Funding Source:** National Science Foundation (CISE CPS)
- **Graduate Research Assistant: US Ignite: Enabling Connected Vehicle Applications through Advanced Network Infrastructure (Spring 2016 - Fall 2017)**
 - **Description:** Development and evaluation of an experimental connected vehicle testbed, South Carolina Connected Vehicle Testbed (SC-CVT), intended to provide a hardware-based, edge computing enabled testing environment for research within the connected vehicles domain.
 - **Funding Source:** National Science Foundation (CISE CPS)

RESEARCH PUBLICATIONS

- M. Kaur (2022) “SNAP: A Software-Defined & Named-Data Oriented Publish-Subscribe Framework for Emerging Wireless Application Systems.”
- S. Kotian, Y. Elzein, A. Dominguez, S. Lim, N. Amini, & M. Kaur (2025). A Hybrid Pub/Sub and REST-based Communication Strategy for Intelligent IoT System Interoperability. *Proceedings of the IEEE CCNC 2025 IIWOT Workshop*
- N. Mehrabi, S. Boroujeni, J. Hofseth, A. Razi, L. Cheng, M. Kaur, ... & R. Amin (2024). Adaptive Data Transport Mechanism for UAV Surveillance Missions in Lossy Environments. *arXiv preprint arXiv:2410.10843*.
- Chatterjee, Rohan, Dikshant Sagar, Farnaz Mohammadi, Arpit Vaishya, Mohammad Pourhomayoun, Manveen Kaur, Jung Soo Lim, and Navid Amini. "Deep Residual Dilated Convolutional Learning for Detection of Large Vessel Occlusion in Ischemic Stroke Patients." In *2024 IEEE First International Conference on Artificial Intelligence for Medicine, Health and Care (AIMHC)*, pp. 28-34. IEEE, 2024.
- Mousavian, A., Jarkaneh, J., Pourhomayoun, M., Kaur, M., Chatterjee, R., Besharati, S., ... & Amini, N. (2024, February). Deep Learning Image Analysis of Macular Optical Coherence Tomography Angiography Images for Detection of Progression in Glaucoma. In *2024 IEEE First International Conference on Artificial Intelligence for Medicine, Health and Care (AIMHC)* (pp. 130-136). IEEE.

- M. Kaur, A. Razi, L. Cheng, R. Amin, J. Martin, "Design and Evaluation of an Application-Oriented Data-Centric Communication Framework for Emerging Cyber-Physical Systems.", *Proceedings of IEEE Consumer Communications & Networking Conference 2023*
- J. Martin, M. Kaur, A. Razi, L. Cheng "Towards Connecting the Disconnected Internet.", *Proceedings on 2022 International Conference on Computer Communications and Networks (ICCCN). IEEE, 2022*
- M. Kaur, R. Amin, J. Martin, "The Design and Validation of ICN-Enabled Hybrid Unmanned Aerial System", *Proceedings of MILCOM Conference*, December 2021
- M. Kaur, G. Ali, A. Rayamajhi, B. Ayalew, J. Martin, "Network Driven Performance Analysis in Connected Vehicular Networks", *Proceedings of the IEEE VTC Conference*, September 2019
- V. Rastogi, R. Merco, M. Kaur, A., Rayamajhi, M. Gavelli, G. Papa, P. Pisu, S. Babu, A. Robb, and J. Martin, "An Immersive Vehicle-in-the-loop VR Platform for Evaluating Human-to-Autonomous Vehicle Interactions," *Proceedings of WCX: SAE World Congress Experience*, 2019.
- A. Rayamajhi, M. Rahman, M. Kaur, J. Liu, M. Chowdhury, H. Hu, J. McClendon, K. Wang, A. Gosain, J. Martin, "ThinGs In a Fog: System Illustration with Connected Vehicles", *Proceedings of the IEEE Vehicular Technology Conference (VCT'17)*, (Sydney, AU, June 2017).
- M. Kaur, H. Hu, J. Martin, "Comprehensive View of Security in Vehicular Networks", *Proceedings of the International Conference on Connected Vehicles and Expo (ICCVE'16)*, (Seattle, WA, Sept 2016).
- A. Sharma, M. Kaur, Z. Koradia, R. Nishant, S. Pandit, A. Raman, A. Seth, "Revisiting the state of cellular data connectivity in India", *Proceedings of the 2015 Annual Symposium on Computing for Development (pp. 149-157). ACM*, December 2015

RESEARCH PRESENTATIONS/TALKS

- "Adaptive Data Transport Mechanism for UAV Surveillance Missions in Lossy Environments.", *Presented at IEEE Consumer Communications & Networking Conference 2025*
- "Advancing practical frameworks for AI/ML Deployment in Real-World CPSs ", *Presented at Seminar in Interdisciplinary STEM Research, hosted by CREST-CATSUS and Sikand SITI Centers at The College of ECST, Cal State LA, October 2024*
- "Design and Evaluation of an Application-Oriented Data-Centric Communication Framework for Emerging Cyber-Physical Systems.", *Presented at IEEE Consumer Communications & Networking Conference 2023*
- "The Design and Validation of ICN-Enabled Hybrid Unmanned Aerial System", *Presented at MILCOM 2021, December 2021*
- "Towards Secure-Infrastructure-based Cooperative Adaptive Cruise Control", *Presented at The USDOT Center for Connected Multimodal Mobility (C2M2) Fall Conference, October 2018*
- "Comprehensive view of security practices in vehicular networks", *Presented at 2016 International Conference on Connected Vehicles and Expo (ICCVE), September 2016*

OTHER PROFESSIONAL ACHIEVEMENTS

- Panelist on three NSF Review Panels for the NSF Directorate for Technology, Innovation and Partnerships and NSF Directorate for Computer and Information Science and Engineering (Summer 2024)
- Reviewer for Atmosphere Journal, Fall 2023; Applied Sciences Journal, Spring 2024; Electronics Journal: Advanced Machine Learning Applications for Security, Privacy, and Reliability, Spring 2024; Electronics Journal: Advances in Future Wireless Networks, Spring 2024
- Session Chair for Various sessions on Systems and Networks at IEEE CCNC 2025
- MS Thesis Advisor:
 - Hafiz Raheem (Fall 2023 - Spring 2024): *ML-based Smart Pedestrian Crossing System*.
 - Youssef Elzein (Fall 2024 - Spring 2025): *AI/ML integrated UAV swarms*
 - Ekta Mulkalwar (Spring 2025 - Spring 2026): *Distributed AI/ML models for resource-constrained systems*
- Faculty Participant in:
 - Quantum Computing Workshop, held at California State University Long Beach (Summer 2024)
 - NCFDD Faculty Success Program (Spring 2023)
 - CSU NSF CAREER Workshop Series (Spring 2023)
 - 2023 NSF Engineering CAREER Mock Proposal Panel (Spring 2023)
 - ASEE course on the essentials of effective proposal preparation (Summer 2023)

SERVICE ACTIVITIES

• University Level

- **Committee Member: University Faculty Policy Committee (Fall 2024)** - Served as the representative of The College of ECST on the Faculty Policy Committee.

- **Oral Presentation Judge: Office of RSCA Student Symposium (Spring 2025)** - Serving as a faculty judge for the ORSCA Student Symposium Oral Presentations.
- **College Banner Carrier at University Commencement (Spring 2023)**
- **College Level**
 - **Participated in ECST Engineering Week Faculty Highlight (Spring 2024)** - Invited to discuss personal academic experiences with ECST students.
 - **ECST Honors Commencement 2023, 2024** - Served as Marshall in 2023, and Name Reader in 2024
 - **Preview Day 2023, 2024** - Introduced incoming freshmen, transfer students, and their parents to the broad area of CS and the CS Department.
 - **Eagle Fest 2023** - Manned CS booth and discussed CS programs with attendees
- **Department Level**
 - **Chair: CS Department Student Affairs Committee AY 2024-2025**
 - **Chair: CS Department Industry Advisory Board (IAB) AY 2022-2023, AY 2023-2024** - Organized the annual meeting of the industry advisory board, facilitated discussion on potential improvements in the current Computer Science curriculum to promote students' industry-readiness
 - **Committee Member: Lecturer Evaluation Taskforce AY 2022-2023, AY 2023-2024, AY 2024-2025** - Evaluated lecturers as requested.
 - **ABET Course Coordinator 2024** - ABET Course coordinator for CS 2470, CS 3035, CS 5035.
 - **Chair: Chair Re-election Committee 2022-2023** - Conducted activities relevant to the re-election of the CS Department Chair in Spring 2023
 - **Organized a workshop activity during the 18th Annual ECST Open House 2022**— organized a workshop activity introducing middle- and high-school students to cybersecurity and cryptography.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Institute of Electrical and Electronics Engineers (IEEE), Association for Computing Machinery (ACM), Computer Science Teachers Association (CSTA)