Venkat Sai Suman Lamba Karanam

Curriculum Vitae

School of Computing
University of Nebraska-Lincoln
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Research Interests

Intersection of AI/ML, networks & security, and large dataset analysis.

Education

Fall 2016;Fall 2017;Fall 2018–present **PhD, Computer Science & Engineering**, *University of Nebraska-Lincoln*, Lincoln, NE
Large Data Transfers, Optimization in the Networks, Realtime Machine Learning in the Networks, Software-defined Networks, Distributed Computing

2013–2015: **Master of Science, Computer Science & Engineering**, *University of Nebraska-Lincoln*, Lincoln, NE
Distributed and Cluster Computing

2009–2013: **Bachelor of Technology, Information Technology**, *Jawaharlal Nehru Technological University*, Hyderabad, India

Relevant Publications

1. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. A transfer time prediction system for high-throughput computing networks using dynamical systems modeling. In *2023 IEEE International Conference on Computer Communications*, pages 1–10. NETSOFT, 2024
2. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Collective deep network matrix factorization for large-scale modeling of the internet backbones. In *2023 IEEE Future Networks World Forum*, pages 1–8. FNWF, 2023
3. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Dycrono: Dynamic cross-layer network orchestration and real-time deep learning-based network load prediction. In *2023 Optical Network and Design and Modelling*, pages 1–6. ONDM, 2023
4. **Lamba Karanam, Venkat Sai Suman**, Fahmida Afrin, Byrav Ramamurthy, and Nirnimesh Ghose. Poster: Cross-layer device identification for smart grid substation networks. In *2023 IEEE Conference on Communications and Network Security*, pages 1–6. CNS, 2023
5. Baofeng Zhou, **Karanam, Venkat Sai Suman Lamba**, and Mehmet C Vuran. Impacts of soil and antenna characteristics on lora in internet of underground things. In *2021 IEEE Global Communications Conference (GLOBECOM)*, pages 1–6. IEEE, 2021
6. Mohammad MR Lunar, Jianxin Sun, John Wensowitch, Michael Fay, Halit Bugra Tulay, **Karanam, Venkat Sai Suman Lamba**, Brian Qiu, Deepak Nadig, Garhan Attebury, Hongfeng Yu, et al. Onelnk: One link to rule them all: Web-based wireless experimentation for multi-vendor remotely accessible indoor/outdoor testbeds. In *Proceedings of the 15th ACM Workshop on Wireless*

Network Testbeds, Experimental evaluation & Characterization, pages 85–92, 2022

7. Sachin Sharma, Saish Urumkar, Gianluca Fontanesi, **Karanam, Venkat Sai Suman Lamba**, Boyang Hu, Byrav Ramamurthy, and Avishek Nag. Towards emulation of intelligent iot networks on eu-us testbeds. In *2022 International Seminar on Intelligent Technology and Its Applications (ISITIA)*, pages 484–489. IEEE, 2022
8. **Lamba Karanam, Venkat Sai Suman**. Scheduling and prefetching in hadoop with block access pattern awareness and global memory sharing with load balancing scheme. *Digital Commons*, 2019

Publications Awaiting Decisions

1. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Enhancing ml-based network instrusion and anomaly detection using a spatio-temporal encoding distance metric. In *2024 IEEE Local Computer Networks*, pages 1–6. IEEE LCN, 2024
2. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Online federated learning on remote testbeds for real-time network analysis. In *2024 IEEE Edge Network Softwarization (ENS 2024)- Co-located with NestSoft 2024*, pages 1–10. ENS, 2024
3. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Analyzing billions of packets on the optical backbone using a collective deep network matrix factorization (INVITED). In *20234 Special Issue of the Journal of Optical Communication Networks (JOCN)*, pages 1–15. JOCN, 2024
4. **Lamba Karanam, Venkat Sai Suman** and Byrav Ramamurthy. Online machine learning for multi-layer network control, load prediction and balancing. In *2024 IEEE Transactions on Machine Learning and Communication Networks*, pages 1–13. TMLCN, 2024
5. **Lamba Karanam, Venkat Sai Suman**, Fahmida Afrin, Byrav Ramamurthy, and Nirnimesh Ghose. An Unsupervised Cross-Layer Approach for Device Classification and Attack Detection in Critical Infrastructure Networks. In *2024 IEEE Conference on Communications and Network Security (CNS)*, pages 1–6. CNS, 2024

Non-refereed

1. **Karanam, Sai Lamba**, Fahmida Afrin, Boyang Hu, Byrav Ramamurthy, and Nirnimesh Ghose. Poster: Hardware isolated smart grid security. *UNL Student Research Days*, 2023
2. **Karanam, Sai Lamba** and Byrav Ramamurthy. Poster: Ag-iot security through network analysis hardware-assisted encryption. *National Strategic Research Institute (NSRI) Conference*, 2023
3. **Karanam, Sai Lamba** and Byrav Ramamurthy. Poster: Detecting Cyberthreats to Critical Cyberinfrastructures using Ensemble Machine Learning Techniques. *National Strategic Research Institute (NSRI) Conference*, 2024

Research Experience

Adobe Systems, CA

Summer-Fall, 2021 — **Graduate Researcher**
Just-in-time (JIT) streaming optimization of data transfers for large-scale machine learning workloads.

Spring, 2016 — **Graduate Researcher**
Hardware Isolation-based Security measures using Intel SGX and ARM TrustZone technologies.

UNL, NE

2019 – present **Research Assistant**
Research in network optimization, software-defined networks (SDN), large data transfers, and machine learning.

Summers 2021, 2022 & 2023 **Graduate Research Fellow**
Developed frontend/backend applications and integrated Machine Learning methods for an irrigation project with Institute of Agriculture and Natural Resources (IANR).

Positions of Responsibility

Program Committee

2024 **Publicity Chair**, *IEEE International Conference on Advanced Networks and Telecommunications Systems 2024 (IEEE ANTS)*

2024 **Technical Program Committee**, *IEEE 29th Symposium on Computers and Communications (ISCC)*

2024 **Technical Program Committee**, *IEEE/ACM Cloud2Things Workshop*

2023 **Program Committee**, *CoNext 2023 Artifact Evaluation Committee*, International Conference on emerging Networking EXperiments and Technologies 2023

Reviewer

2024 **ACM Computers and Communications Security (CCS)**

2024 **IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN)**

2024 **IEEE International Conference on Communication (ICC)**,

2024 **IEEE 11th Workshop on Computer and Networking Experimental Research using Testbeds (CNERT)**

2023 **IEEE International Conference on Communication (ICC)**,

Miscellaneous

2024 **External Faculty Mentor**, *St. Bonaventure University*, High School Research Experience Program, Summer 2024

2021-2024 **Grant Writing**, *Assisted my PhD Supervisor in NSF, DoE and miscellaneous grant proposal writing*

2020 **Student Volunteer**, *International Conference on Computer Communications*, INFOCOM 2020

2019 **Graduate Curriculum Representative**, *UNL*, School of Computing

2015 **Judge**, *ACM Regional Programming Contest*, Lincoln, NE

Awards and Miscellaneous

2024 **Outstanding Graduate Student Research Award**, School of Computing (SoC) at UNL.

2023 **Most Improved Doctoral Candidate**, School of Computing (SoC) at UNL.

2022 **SciAuth Fellowship** with SciAuth program funded by NSF, as a PhD Student Fellow.

2017 **Outstanding Graduate Teaching Award**, School of Computing, UNL.

2015 **Award for Contribution to Students**, Teaching Council & Parent's choice, UNL.

2014 **Third Place in Coding Competition**, Lincoln Hackathon at FireSpring Inc, Lincoln NE.

College-level Teaching

2017-2018 **Full Instructor of Record** for **CSCE:236: Embedded Systems Applications,** School of Computing, UNL

2022 **Guest Lecturer** for **CSCE862: Advanced Topics in Networks: Block Chain**

2015 **Guest Lecturer** for **CSCE863: Communication Networks**

Technical skills

Programming Languages & Libraries: Julia, Python, PyTorch, keras, C++, Advanced JAVA, Javascript, Networking in Linux/Unix, Software-defined Networks (SDN)

Hardware Technologies: Universal Software Radio Peripheral (USRP), Embedded Devices (IoT)

Teaching Assistantship

2022 - 2021 **CSCE863: Advanced Topics in Networks: Block Chain**, UNL

2022 - 2021 : **CSCE952: Advanced Computer Networks**, UNL

Others: **CSCE877: Cryptography Techniques, CSCE851: Operating Systems Principles, CSCE863: Communication Networks**, UNL