KAMRAN ALI

Personal Information

Senior R&D Scientist — General Motors
US Permanent Resident
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Email: kamran.luminite@gmail.com
Google Scholar: 1900+ citations
https://smkrali.github.io/

Personal Statement

A hands-on technical leader, inventor, and problem solver; trained in research. I enjoy building real, working end-to-end systems & applications that involve multi-disciplinary skills, including both hardware and software, and like to collaborate with experts from other domains for interdisciplinary work. I am an expert in system integration and can effectively build an end-to-end system that may involve a variety of skills including hardware design, fast prototyping, firmware programming, signal processing, machine learning and proof-of-concept demos. Both through my academic and industry work, I have gathered extensive experience in algorithms and techniques for advanced sensing and connectivity, and related end-to-end implementation on prototyped hardware. My publications have been cited 1900+ times and my contributions have resulted in 50+ patents. I am a strong team player, quick learner, easily adapt to new things, and can get the job done.

Interests & Expertise

Connected Sensing Systems, Sensor Fusion, Signal Processing, Machine Learning, Data Science, Localization & Mapping Systems (SLAM), Sensor Calibration, Wireless, IoTs, Computer Networks, Mobile/Edge & Cloud Computing, HW/SW System Integration & Performance Modeling

Work Experience

Senior R&D Scientist — **March 2020 to Present**

Vehicle Systems Research Lab, General Motors Global R&D, Warren, MI, USA

Contributions Focus: Connected ADAS/Autonomy and Vehicle Experience

- Vehicular communications and RF sensing (in-cabin/external), Cloud & Edge Computing
- Multidimensional sensor data fusion and signal processing, SLAM, Sensor Auto-Calibration
- ML/AI techniques for vehicle perception, crowd-sensing, federated training, and cooperative-awareness
- Proposed and delivered 6 advanced technology works to engineering (managed $1.2M+ in funding)
- Mentored 10+ interns, contractors, and junior engineers with successful project outcomes

PhD Research Scholar - Graduate Research/Teaching Assistant — **Aug 2014 to Feb 2020**

Systems and Security Lab, Computer Science and Engineering, MSU

PhD Research Associate

Pervasive & Ubiquitous Systems Group, Nokia Bell Labs, Cambridge, UK — **June 2019 to Aug 2019**
Pervasive & Ubiquitous Systems Group, Nokia Bell Labs, Cambridge, UK — **June 2018 to Aug 2018**
Applied Sciences Group, Microsoft Research, Redmond, Washington, USA — **May 2017 to Aug 2017**
Mobile Communications & Networking Group, NEC Labs, Princeton, USA — **May 2016 to Aug 2016**
Networking and Mobility Lab, Hewlett Packard Labs, Palo Alto, USA — **May 2015 to Aug 2015**

Senior Research Assistant — **January 2013 to Aug 2014**

ADCOM Lab, Department of Electrical Engineering, LUMS

- Safety Assurance in High Stress Environments (SAHSE) with Wireless Sensor Networks (WSNs)
- Design and Implementation of a Low Cost COTS Wireless Sensor Nodes

** More details about my projects before joining MSU can be found on my website *http://smkrali.weebly.com/*

Education

Michigan State University, East Lansing, Michigan, USA

PhD Computer Science and Engineering — **Aug 2014 to Dec 2019**

- Thesis: *Signal Processing and Machine Learning Approaches to Enabling Advanced Sensing and Networking Capabilities in Everyday Infrastructure and Electronics*
- Prominent works: *Human Activity/Gesture Recognition Using WiFi, RFID and mmWave Signals, Sleep Monitoring Using WiFi Signals, Fine-grained Vibration Based Sensing for Smartphones, Gesture Based Authentication on Smartphones, Distributed Spectrum Sharing in Powerline Communications*

LUMS, School of Science & Engineering, Lahore, Pakistan

B.S. Major: Electrical Engineering, Minor: Computer Sciences — **June 2013**

- Senior Thesis: Outlier/Event Detection, Identification and Localization for Wireless Sensor Networks in Harsh Environments with Hardware Implementation on EZ430-2500 TI Motes

Relevant Advanced Courses

Detection & Estimation Theory, Stochastic Processes & Applied Probability, Digital Signal Processing, Deep Learning, Machine Learning, Data Mining, Design & Theory of Algorithms, Embedded Systems Design, Digital System Design, Distributed Systems/Advanced Operating Systems, Wireless Communications, Digital Communications, Information Theory, Error Correction Coding, Computer & Network Security

Relevant HW/SW Skills & Experience

- **Hardware**
  - Micro-Controllers and Embedded Development. Boards: XILINX FPGA's, Mini 6410, GSM Module, MSP/CC-430, ESP-32, DSP (e.g., TMS320C6711), GPU platforms like Jetson Nano/AGX-Orin, USRPs.
  - Data Acquisition and Interfacing: I2S, I2C, USB, SIM, UART, GPIOs, CAN, etc.
  - Multilayer PCB Design (Altium Designer), Antenna Design (HFSS), RF components
  - Sensors: GPS, IMU, Lidars, Radars, Cameras/Vision, Audio, Humidity, Temperature, etc.
  - Lab instruments: Spectrum Analyzers, Oscilloscope, Logic Analyzers, Multimeters, and Power Analyzers
- **Software**
  - Latex, Linux, MATLAB, Simulink, HFSS, Altium Designer, Xilinx Vivado, LTSpice, 3D CAD/Printing
- **Application Development**
  - Embedded Linux (C/C++), Windows (C++, JAVA), Android (JAVA), iOS (Objective-C)
- **Programming**
  - C/C++, JAVA, Python, MATLAB, VHDL

Extra-curricular and Community Service Information

- Co-Founder of *Teach My Nation*: Our goal is to make *quality* school education affordable to underprivileged kids in Pakistan, provide them with necessary material, track their progress, and career counseling.
- Served as Technical Program Committee (TPC) member in IFIP Networking 2019
- Reviewer: IEEE Vehicular Networking Conference, IEEE Transaction on Mobile Computing, IEEE Transactions on Vehicular Technology, IEEE Sensors Journal, IEEE Transactions on Wireless Communications, ACM Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), IEEE Mobile Ad-Hoc Networks and Smart Systems (MASS), IEEE Transactions on Dependable and Secure Computing, IEEE Communications Magazine, IEEE Transactions on Sensor Networks
- Treasurer in Council of Graduate Students (COGS), Michigan State University 2017-2018
- Executive Board Representative of International Students Association (ISA) in Council of Graduate Students (COGS), Michigan State University 2016-2017
- President in Pakistani Students Association, Michigan State University 2014-2016
- Director Public Relations in Pakistani Students Association, Michigan State University 2016-2017