

Akash Deep Singh

(+1) 310-424-8440 • www.akash.us • akash.a283@gmail.com • linkedin.com/in/akashd33psingh

EDUCATION

University of California, Los Angeles (UCLA)

Ph.D. (E&MS) in Electrical and Computer Engineering, 3.975/4.0

Los Angeles, CA

Sep. 2018 – Present

IIT-Delhi

B.Tech in Electronics and Communication Engineering, 8.81/10

New Delhi, India

Aug. 2014 – May 2018

RESEARCH INTERESTS

Multi-modal Fusion, Human-computer Interaction, RF Sensing, Computer Vision, mmWave

I design and build hardware and software frameworks that allow agents (humans and machines) to better perceive their environments. My Ph.D. research aims to combine radio-frequency (RF) sensing with vision to create richer, robust and ubiquitous sensing paradigms. Through my thesis, I aim to bridge the gap between RF sensing hardware and machine learning frameworks in the Internet of Things.

EXPERIENCE

Applied Scientist Intern

Amazon

June 2022 – September 2022

Seattle, WA

- Developed models that can detect various types of frauds using user behavior patterns (mouse, keyboard gestures) and browsing behavior for the Buyer Risk Prevention (BRP) Team.
- ML Stack: Temporal models such as LSTMs, multi-modal fusion, gradient boosting, and temporal self-attention
- Tech Stack: Python, PyTorch, Scikit-learn

Research Intern

Nokia Bell Labs

June 2021 – August 2021

Virtual

- Developed a self-supervised framework for extracting features from RF+camera data using contrastive learning. The framework outperformed its supervised counterpart on downstream tasks even with less training data – accepted at IEEE ICC 2022.
- ML Stack: Self-supervised learning, contrastive learning, CNNs, multi-modal fusion, and self-attention
- Tech Stack: Python, PyTorch, Scikit-learn

Graduate Student Researcher

University of California, Los Angeles

Sep. 2018 – Present

Los Angeles, CA


- Developed a framework to detect, identify and localize hidden wireless sensors such as cameras, motion sensors and RF sensors in a space.
- Developed a framework for Human Activity Recognition (HAR) using mmWave radar.
- Exploring ways to fuse sensors such as camera and radar for richer understanding of scenes.

SELECTED PUBLICATIONS ([GOOGLE SCHOLAR](#) [↗](#))

Top tier venues – USENIX Security, ACM SenSys, ACM TOPS, IEEE ICC, IEEE RadarCon, JAMIA

- **I Always Feel Like Somebody's Sensing Me! A Framework to Detect, Identify, and Localize Clandestine Wireless Sensors** - USENIX Security 2021 [[Acceptance Rate 16%](#)]
- **Dense Depth Estimation via the Fusion of mmWave Radar Point Cloud with a Camera Image** - (Under Review)
- **RadHAR: Human Activity Recognition from Point Clouds Generated through a Millimeter-wave Radar** - mmNets 2019 (MobiCom 2019)
- **UWHear: through-wall extraction and separation of audio vibrations using wireless signals** - ACM SenSys 2020 [[Acceptance Rate 20%](#)]
- **On collaborative reinforcement learning to optimize the redistribution of critical medical supplies throughout the COVID-19 pandemic** - Journal of the American Medical Informatics Association [[Impact Factor 4.11](#)]
- **InkFiltration: Using Inkjet Printers for Acoustic Data Exfiltration From Air-Gapped Networks** - ACM Transactions on Privacy and Security [[Impact Factor 1.91](#)]
- **Self-Supervised Radio-Visual Representation Learning for 6G Sensing** - IEEE International Conference on Communications (ICC) 2022

PROJECTS

- Reinforcement Learning based redistribution of supplies during the COVID-19 pandemic** 2020-21
Under the supervision of Dr. Mihaela Van der Schaar Los Angeles, CA
- Designed and developed a reinforcement learning agent that can facilitate near-optimal collaborative exchange of equipment between states in real-time to bolster the public health response to future diseases.
 - Published in Journal of the American Medical Informatics Association (JAMIA) – IF 4.11.
- Smart MarketPlace (Selected among the top 6 projects in IoT course)** 2017-18
Under the supervision of Dr. Juhi Ranjan New Delhi, India
- Created a smart marketplace that automatically adds the items picked by a customers to their cart and presents the bill during checkout.
 - Used computer vision methods to identify faces and items being picked.
- Project AVA: Smart backpack for preventing child abduction** 2017-18
Under the supervision of Dr. Aman Parnami New Delhi, India
- Designed and developed an augmented backpack - along with an accompanying Android application - for school-going children to help prevent child abduction.
 - [Project Website](#) 
- OFDMA based D2D Communication using USRP** 2017
Under the supervision of Dr. Vivek Ashok Bohara New Delhi, India
- Used USRPs as nodes of a cellular network as well as a D2D pair. The performance of Cellular link was calculated in the presence of a D2D pair(source of interference) in both overlay and subcarrier sharing mode.

TECHNICAL SKILLS

Languages: [Proficient: C, Matlab, Python]; [Prior Experience: Embedded C, Spice, JavaScript]
Frameworks: PyTorch, TensorFlow, Keras
Tools: [Proficient: Git, GNU Radio, Wireshark, LabView, AngularJS, Bootstrap]; [Prior Experience: Cadence Virtuoso, Eldo Spice, Advanced Design System, LTSPice, Hostapd, iPerf, NodeJS]

AWARDS AND ACHIEVEMENTS

- Amazon Doctoral Fellowship, **2021-22** – Tuition and Stipend
- Electrical and Computer Engineering (ECE) Departmental Fellowship, **2018-19** – Tuition and Stipend
- Graduate Student Association (GSA) Presidential Service Award, **2020-21**
- Semi-finalist, UCLA Grad Slam, **2020**
- Served as the Elections Commissioner / Attorney General for the GSA, 2 terms, **2020-22**
- Founding committee, ECE mentor of the year award that is awarded to the best mentors in the department, **2021**
- Dean's List for academic achievement, IIIT-D, **2017**
- First Prize, Innovation Challenge, Innovation Challenge (IIIT-D), **2017**
- National Talent Search (NTSE) Scholar, Government of India, **2010**