# Ish Kumar Jain

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## Research Statement

My research takes a multi-faceted approach to optimize wireless networks. I focus on enhancing throughput and addressing crucial factors such as reliability, low latency, security, and ease of deployment in real world scenarios.

## Education

2018 - 2024 **University of California San Diego**, *CA*.
PhD, Electrical and Computer Engineering, *GPA: 4.0*
*Advisor: Prof. Dinesh Bharadia*

2016 - 2018 **New York University, Tandon School of Engineering**, *NY*.
MS, Electrical and Computer Engineering, *GPA: 3.96*
*Advisor: Prof. Shiv Panwar*

2012 - 2016 **Indian Institute of Technology (IIT Kanpur)**, *India*.
Bachelors of Technology (B.Tech.), Electrical Engineering, *GPA: 9.5 (out of 10)*

## Professional Experience

June–Sep 2022 **VMware**, *Palo Alto, CA, USA*.
*Mentor: Dr. Rakesh Misra*
- Designed and patented a near-real-time application (xApps) with VMware RIC in Open-RAN framework.

June–Aug 2017 **Nokia Bell Labs**, *Murray Hill, NJ, USA*.
*Mentor: Dr. Özge Kaya*
- Developed an RL-based beam training algorithm for mmWave links, demonstrating 60% efficiency improvement over a baseline on real-world data.

## Awards and Honors

- Best Poster Runner-up, Hotmobile 2023.
- VMware intern achievement award with $250,000 research grant 2022–23.
- Qualcomm Innovation Fellowship winner $100,000 research grant 2022–23.
- Winner of 3-minute research talk competition at ACM Mobisys'20, Mobicom'21, Mobicom'22.
- Commencement award for the best graduate student service in ECE, UC San Diego, May 2021.
- Commencement award for the best MS Academic Achievement in ECE, New York University, May 2019.
- Commencement award (Motorola Gold Medalist) for the best all-round performance in Electrical Engineering and Computer Science, IIT Kanpur, May 2016.
- Travel grant for MobiCom New Delhi 2018, Hotmobile CA 2023, Infocom NY 2023.
- Samuel Morse MS Fellowship ( $100,000 financial support during MS at NYU) 2016–2018.
- Secured All India Rank 390 (amongst 0.5 million students) in IIT–Joint Entrance Exam 2012.

## Publications

IEEE Infocom 2023 mmFlexible: Flexible Directional Frequency Multiplexing for Multi-user mmWave Networks
**IK Jain**, RR Vennam, R Subbaraman, D Bharadia – Media coverage

IEEE S&P 2023 mmSpoof: Resilient Spoofing of Automotive Millimeter-wave Radars using Reflect Array
*IEEE Security and Privacy 2023.*
RR Vennam, **IK Jain**, K Bansal, A Ranganathan, D Bharadia – Media coverage

WPMC 2022 VRProj: Delivering 360-degree video with Viewport-adaptive Truncation
*International Symposium on Wireless Personal Multimedia Communications (WPMC) 2022*.
T Qiu, **IK Jain**, R Wu, P Cosman, D Bharadia

HotCarbon 2022 Multiple smaller base stations are greener than a single powerful one: Densification of Wireless Cellular Networks, *ACM HotCarbon Workshop 2022*
A Gupta, **IK Jain**, D Bharadia

Sigcomm 2021 [mmReliable] Two beams are better than one: Towards Reliable and High Throughput mmWave Links
**IK Jain**, R Subbaraman, D Bharadia – Media coverage

ACM mmNets 2020 mMobile: Building a mmWave Testbed to Evaluate and Address Mobility Effects
*4th ACM Workshop on Millimeter-Wave Networks and Sensing Systems (Mobicom Workshop)*, 2020.
**IK Jain**, R Subbaraman, TH Sadarahalli, X Shao, H Lin, D Bharadia

Usenix NSDI 2020 LocAP: Autonomous Millimeter Accurate Mapping of WiFi Infrastructure
R Ayyalasomayajula, A Arun, C Wu, S Rajagopalan, S Ganesaraman, A Seetharaman, **IK Jain**, D Bharadia

MDPI Journal 2019 Extreme Multiclass Classification Criteria, *MDPI Computation Journal*, 2019.
A Choromanska, **IK Jain**

IEEE JSAC 2018 The Impact of Mobile Blockers on Millimeter Wave Cellular Systems
*IEEE Journal on selected areas in communications (JSAC)*, 2018
**IK Jain**, R Kumar, S Panwar

IEEE ITC 2018 Driven by Capacity or Blockage? A Millimeter-wave Blockage Analysis
*IEEE International Teletraffic Congress (ITC) 2018*
**IK Jain**, R Kumar, S Panwar – Invited paper

## Posters/ Demos

Mobicom 2023 [Demo] A Compact and Real-Time Millimeter-wave Experiment Framework with True Mobility Capabilities
**IK Jain**, S MM, D Bharadia

Hotmobile 2023 [Poster] Delay Phased Arrays: Towards programmable beam-bandwidth for 5G networks
**IK Jain**, RR Vennam, D Bharadia – Best Poster Runner-up

Mobicom S3 2021 Demo and dataset for mmWave multi-beam tracking using mMobile 28 GHz testbed
**IK Jain**, R Subbaraman, D Bharadia

MobiCom 2018 [Poster] Facilitating Low Latency and Reliable VR over Heterogeneous Wireless Networks
A Ravichandran, **I K Jain**, R Hegazy, T Wei, D Bharadia

## Patents

US Patent (provisional) R Misra, **IK Jain**, et al., inventors. A platform for xApp development with RAN intelligent controller. *Patent pending, contact VMware*

US Patent (provisional) D Bharadia, **IK Jain**, R Subbaraman, T Sadarahalli, inventors. Enabling Reliable Mmwave Link Using Multi-Beam Pro-Active Tracking. *Patent pending, contact UC San Diego (innovation@ucsd.edu)*

US Patent (granted) D Bharadia, R Ayyalasomayajula, A Arun, C Wu, S Rajagopalan, S Ganesaraman, A Seetharaman, **IK Jain**, inventors. Enable Indoor Navigation with Context assisted Localization.

## Teaching and Mentoring Experience

**Teaching Assistant**.

WI 2021,23 ECE 257B- Modern Wireless Communication (Graduate) – best TA 10/10 rating.

Spring 2020 ECE 157B- Communication and Sensing Systems (Undergraduate) – helped design a new class.

Spring 2018 EEGY 9123- Introduction to Machine Learning (Graduate).

Fall 2017 EEUY 4563- Introduction to Machine Learning (Undergraduate) – helped design a new class.

Spring 2017 ELGY 6373- Internet Architecture and Protocols Lab (Graduate).

**Mentorship**, I mentored two PhD students and 10+ BS/MS students at UC San Diego. I particularly help historically underrepresented and underprivileged students.

## Leadership

2021–2022 **The Marconi Society**, *Scholar in Residence*.
Served as a student scholar for facilitating the Marconi Society meetings with the chair Vint Cerf and other prominent scientists, engineers, and policymakers.

2021–2022 **Escribamos Ciencia K12 team**, *UC San Diego*.
Developed interesting science modules and videos for K12 students on topics such as electricity, internet, nuclear power, etc., under guidance of Prof. Olivia Graeve.

2020–2022 **Coordinator, Jacobs Undergraduate Mentorship Program**, *UC San Diego*.
Mentored underprivileged students through lab tours, industry talks, panel discussions, technical workshops, etc., and bridged the communication gap between undergraduates and graduate students.

2020–2021 **O.W.L Reading group**, *Inter-continental collaboration*.
Founded in Fall 2020 as a small group of Ph.D. students interested in research talks and discussion on recent conference papers and has grown over 100+ members in a year.

2019–2021 **Vice President, ECE graduate student council**, *UC San Diego*.
Responsible for providing communication between ECE students and the ECE department and organizing weekly events such as seminars and coffee hours.

## Services

2023 **Co-chair**.
ACM Mobicom S3 Workshop 2023
ACM Mobicom mmNets 2023

2019–2023 **Artifact Evaluation Committee**.
ACM Sigcomm 2023
ACM Mobicom 2023
ACM CoNEXT 2019

2021–2022 **Technical Program Committee (TPC)**.
ACM Mobicom S3 Workshop 2021
IEEE WCNC 2022

2019–2023 **Technical Reviews**.
IEEE Trans. Vehicular Technology (TVT) 2019-20
National Conference on Communications (India) 2021
IEEE Globecom 2021
IEEE WCNC 2022, 23
IEEE Access 2021-23
IEEE SPAWC 2022
IEEE Comm Letter 2022, 2023
IEEE JSAC 2023

2021–2022 **Lead organizer and moderator**.
Sigcomm'21 Social Trivia
COMSNETS'22 Panel Moderator