Atkinson Hall, UCSD, La Jolla, CA
+1 (347) 570 2502
ikjain@ucsd.edu
www.linkedin.com/in/ishjain

Ish Kumar Jain

Education

May 2022 **Doctorate of Philosophy (PhD)**, *University of California San Diego, Jacobs School of Engineering*.
Major: Electrical Engineering, ***GPA: 4.0 (out of 4)***
- Graduate Research Assistant with Prof. Dinesh Bharadia.
- **Selected Courses:** Modern Communication Networks, Algebraic Coding.

May 2018 **Master of Science (MS)**, *New York University, Tandon school of Engineering*, Brooklyn, NY.
Major: Electrical Engineering, ***GPA: 3.96 (out of 4)***
- Samuel Morse MS Fellowship 2016-2018 | Academic Excellence Award 2017.
- **Teaching:** Machine Learning (Spring-2018 and Fall-2017) | TCP-IP Lab (Spring-2017).
- **Selected Courses:** Advanced Machine Learning, Massive-MIMO, Networks & Mobile Systems, Network Modeling and Analysis, Internet Architecture and Protocols, Probability and Stochastic Processes, Scientific Computing.

May 2016 **Bachelors of Technology (B.Tech.)**, *Indian Institute of Technology (IIT Kanpur)*, India.
Major: Electrical Engineering, ***GPA: 9.5 (out of 10)***
- Motorola Gold Medalist: Convocation award for the best all-round performance in Electrical Engineering 2016.
- Academic Excellence Awardee (top 7% of the batch) in academic terms 2012-13, 2013-14, and 2014-15.
- **Selected Courses:** Wireless Communications, Convex Optimization, Distributed Systems, AI and Data Mining, Advanced Image Processing, Digital Signal Processing, Robotics, C Programming, and Data Structures.

Technical Skills

Programming C, C++, Python (TensorFlow, Keras, Torch)

Software Matlab (CVX), Mininet, OpenCV, GitHub, LaTeX, Shell scripting

Systems Qualcomm Wilocity wil6210, USRP, Quantenna

Research

Sep 2018–Ongoing **Facilitating Reliable Millimeter Wave Link**, *Supervisor: Prof. Dinesh Bharadia*.
- Designing a protocol that exploits multipath components to establish a robust and reliable mmWave link without a significant training overhead.

July 2018–Ongoing **Wireless VR**, *Supervisor: Prof. Dinesh Bharadia*.
- Developing a new optimization framework to transfer VR video over either WiFi or WiGig interface with high reliability and low latency.

Jan–June 2018 **[MS Thesis] Millimeter Wave Blockage Analysis**, *Supervisor: Prof. Shivendra Panwar*.
- Analyzed the impact of blockage by static buildings, mobile blockers as well as self-blockage by the user.
- Our results indicate that the minimum density of BS required to satisfy the QoS for URLLC applications is mainly driven by reliability and latency constraints, rather than coverage or capacity requirements.

Publications

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

ITC 2018 **I K Jain**, R Kumar, S Panwar, "Limited by Capacity or Blockage? A Millimeter-wave Blockage Analysis", *IEEE International Teletraffic Congress (ITC30)*, 2018.

JSAC 2018 **I K Jain**, R Kumar, S Panwar, "Can Millimeter Wave Cellular Systems provide High Reliability and Low Latency? An analysis of the impact of Mobile Blockers", under review at *IEEE JSAC special issue*, 2018.

Internship

June–Aug 2017 **Nokia Bell Labs**, *Murray Hill, NJ, USA*.
Topic: **Millimeter-Wave Beam Training Algorithm Design** | Mentor: Dr. Özge Kaya
- Developed an adaptive beam training algorithm for mobile multi-user scenario in outdoor mmWave cellular networks.
- Achieved an average of over 60% reduction in beam-steering time over sequential search schemes.

Selected Graduate Projects

Feb2017–Mar2018 **Multi-class Classification Tree**, *Research Project under Prof. Anna Choromanska*.
- Contributed towards a theoretical proof of the boosting ability of a newly proposed objective function to reduce the overall misclassification error in a tree based classification framework.

Sep–Dec 2017 **Cell-Free Massive MIMO**, *Term Paper with Prof. Thomas Marzetta*.
- Presented a critical analysis of precoding and power optimization techniques for cell-free Massive MIMO system.

Sep–Dec 2017 **Active Queue Management (AQM) (*Bash, GENI Testbed*)**, *Course Project with Prof. Shiv Panwar*.
- Implemented AQM schemes such as ARED, CoDel, and PIE on Geni testbed and compared their throughput, latency, and fairness performance with default FIFO and other fairness queuing schemes.

Feb–May 2017 **Programmable IoT Platform (*Mininet, Python*)**, *Course Project with Prof. Lakshmi, NYU Courant*.
- Simulated an IoT testbed (a controller and a large number of sensors) on Mininet
- The devices could send sparse amount of data on demand of the controller to save the battery life and data usage.
- Applied regression algorithms at the controller for an application to build the road-traffic-map of a city.

Selected Undergrad Projects

Jan–Apr 2016 **Convex Optimization in MIMO Detection (*MATLAB-CVX*)**, *Term Paper, Convex Optimization*.
- Implemented Semi-Definite Relaxation (SDR) techniques via rank-1 approximation for 16-QAM MIMO Detection using MATLAB-CVX tool and compared the results with traditional zero-forcing based detection scheme.

Jan–Apr 2016 **Tennis Ball Detection and Tracking using Kinect (*C++, OpenCV*)**, *Course Project, Robotics*.
- Implemented real-time algorithms for tennis ball detection using Kinect and applied Extended Kalman Filter for its prediction and tracking. This work is contributed towards a project to train a robot play table-tennis with humans.

Leader/Volunteer

2018–2019 **PhD Representative, ECE graduate student council**, *UC San Diego*.
Responsible for providing communication between first-year students and the Council and organizing regular events such as ECE seminars and coffee hours.

May 2017 **Volunteer, Convocation Ceremony**, *NYU Tandon School*.
Helped in the enforcement of law and management at the NYU Tandon convocation ceremony of above 1000 students at Barclay Center, NYC.

2014–2015 **Coordinator, Fine Arts Club**, *IIT Kanpur*.
Organized Institute level Art Workshops, performed and coordinated stage performance like Speed Art and Sand Art along with a team of 4 members and 25 volunteers.

Awards and Honours

- Awarded student travel grant for MobiCom, New Delhi 2018.
- Awarded 1st Prize in 'Elec-trade', on-the-spot circuit design challenge, Techkriti, IIT Kanpur 2015.
- Selected for Indo European Winter Academy organized with FAU Erlangen & KTH Stockholm 2014.
- KVPY Scholar (Kishore Vaigyanik Protsahan Yojna), awarded to top 600 students in India 2012.
- Secured All India Rank 390 (amongst 0.5 million students) in IIT- Joint Entrance Exam 2012.