

# Puneet Jain

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## Education

### Brigham Young University (BYU)

Masters - Electrical and Computer Engineering [Funded by the ECE Dept. @ BYU]

[Fall 2017-Present]

### Indraprastha Institute of Information Technology, Delhi (IIIT-Delhi)

Bachelors of Technology (with Honours) - Electronics and Communication [Department Rank: 1]

[2013-17]

## Publications

- *[under-review]* Ambuj Mehrish, Prerna Singh, **Puneet Jain**, A.V Subramanyam, Mohan Kankanhalli, "Egocentric Analysis of Dash-cam Videos For Vehicle Forensics", in IEEE Transactions on Circuits and Systems for Video Technology.
- Rishav Jain, Rohan Tiwari, **Puneet Jain**, Sujit PB, "Distributed Fault Tolerant and Balanced Multi-Robot Area Partitioning for Coverage Applications", accepted as a contributed paper in the Proceedings of the 2018 International Conference on Unmanned Aircraft Systems (ICUAS'18)
- Rohan Tiwari, **Puneet Jain**, Sujit Baliyarasimhuni, Sachit Butail and Michael Goodrich, "Effect of Leader Placement on Robotic Swarm Control", accepted as a full paper in the Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (AAMAS2017) [Acceptance Rate 26%] [\[pdf\]](#) [Received AICTE-INAE Travel Grant]
- Nipun Batra, Manoj Gulati, **Puneet Jain**, Kamin Whitehouse, and Amarjeet Singh, "Bits and Watts: Improving energy disaggregation performance using power line communication modems", presented as short (poster) paper at the 1st ACM International Conference on Embedded Systems For Energy-Efficient Buildings (BuildSys' 2014), held in Memphis, USA on 5-6 November, 2014 [Also accepted for presentation in Microsoft Techvista'15] [\[pdf\]](#)

## Experience

### Research Assistant, [Magicc Lab](#), BYU [Present]

**Advisor:** Dr. Cammy Peterson

Working on decentralised multi-agent estimation and non-linear tracking control algorithms for UAVs/AUVs, achieving robust communication and self-organisation while tracking multiple targets.

### Research & Development Intern, [Zenatix](#) [Summer 2016]

**Advisor:** Dr. Amarjeet Singh

Worked on hardware and firmware design of nRF(radio) based low power temperature sensing device and deployment of WiFi based temperature sensors, for communicating with the base smart meter for energy monitoring for office buildings.

### Research Intern, [Emergent and Autonomous Systems Lab](#), IIIT Delhi [Summer 2015]

**Advisor:** Dr. Sachit Butail

Worked on analysing the collective behaviour in pill bugs by processing data for varying density of Pill bugs moving in an annular region.

### Research Intern, [Energy Lab](#), IIIT Delhi [Summer 2014]

Studied approaches for Non Intrusive Load Monitoring, including Electromagnetic Interference from SMPS devices and data rate of PLC Modems.

## Projects

### B.Tech Thesis: Frequency Response Analysis of Mosquito Swarming Behaviour

Built a laboratory microcosm at the National Institute of Malaria Research for studying mosquito swarming behaviour. Developed experimental setup for system identification of insect swarming over a marker. Performed frequency domain analysis of marker following behaviour using control-theoretic methods. **Advisors:** Dr. Sachit Butail, Dr. P.B. Sujit

*[Second prize at IIIT-Delhi Research Showcase Demo Presentation; nominated for best Bachelors Thesis]*

*[Abstract submitted to SIAM DS'19]*

### Low power device for Snow Petrel's nest in Antarctica

Device used for detecting temperature in the nests of Snow Petrels (birds found in Antarctica) and their foraging patterns, using Arduino Pro Mini board, temperature and light sensors and a 3D printed enclosure.

### Audio localisation using ENF Signatures

Worked on using the ENF signatures embedded within audio recordings for forensic purpose, as part of Signal Processing Cup 2016. [\[Report\]](#)

### Awards

- All Round Performance Medal in ECE (2013-17), IIIT-Delhi (Best out of the 2013-17 batch of 175 students)
- Best Academic Performance in ECE (2013-17), IIIT-Delhi (Best out of 35 students)
- IIIT Delhi's **Dean's list** for Academic Excellence in the term 2015-16
- In **Top 3** teams: Hackathon at Summer School for IoT by Microsoft Research, Bangalore and IISc Bangalore
- Summer School for IoT organised by Microsoft Research, Bangalore and IISc Bangalore: **Hackathon 3rd position**
- IIIT Delhi Research Showcase 2015: **Hardware Hackathon Winner**

### Skills

**Languages & Tools:** MATLAB, Python, C, C++, ROS, EagleCAD, SPICE, Verilog, Cadence, SketchUp, 3D Printing

**Hardware:** Arduino, RaspberryPi, Intel Galileo, ESP WiFi boards, nRF (Nordic) radio, Emlid RTK GPS, 3DR Radio

### Positions Held

- Teaching Assistant
  - *Design of Control Systems* for Fall 2017 (BYU)
  - *Embedded Logic Design* for Fall 2015 (IIIT-Delhi)
  - *Digital VLSI Design* for Fall 2016 (IIIT-Delhi)
  - *Introduction to Robotics* for Winter 2017 (IIIT-Delhi)
- **Mentor** for a group of 10 undergraduate first year students during my senior year at IIIT-Delhi

### Community Work

I taught Math, Science and Music to orphan girls aged 8 - 15 and Math and English to high school children, associating with the NGO - [Udayan Care](#) for 2 months during the summer of 2015, for about 15 hours a week.

### Extra-Curricular Activities

I play basketball, and have represented my school and college in Delhi in various tournaments (won twice!). I regularly participate in intra-murals at BYU, both in basketball and soccer! I also love playing table-tennis few times a week.

I play the keyboard and have represented my college (IIIT-Delhi) and high [school](#), in New Delhi for the same. I have also performed at the International Arts Week, held by Kiran Nadar Museum of Arts, Delhi in 2013. I love music and currently trying to learn to play a Ukelele.

I am also fond of mentoring. I've taught Math and Science to school kids, and have helped my cousins, friends, and orphan children understand applicability of what they study. I have also organized and spoken at robotics workshops at my college IIIT-Delhi, teaching freshmen from various colleges about building simple robots and different control algorithms to control them.

I also like organising events, and have been in the organising committee and event teams for the annual technical and cultural festivals during my bachelors.

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