Karan Jain – Resume

Contact Information

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Education

University of California, Berkeley August 2018 - Present
PhD candidate in **Mechanical Engineering**; advisor: Prof. Mark Mueller

- Graduate student researcher at the High Performance Robotics Laboratory
- Majoring in **Controls** with minors in **Robotics** and **Optimization**

University of California, Berkeley August 2018 - December 2019
Master of Science in **Mechanical Engineering**; GPA: **4.00/4.00**

Indian Institute of Technology Bombay, Mumbai, India July 2014 - May 2018
Bachelor of Technology with Honors in **Mechanical Engineering**; GPA: **9.79/10.00**

- **Ranked 1**st in a class of 153 students
- Minor degree in **System and Controls Engineering** with a GPA of **9.80/10.00**

Publications

Docking two multirotors in midair using relative vision measurements
Karan P. Jain, Minos Park, Mark W. Mueller
arXiv preprint arXiv:2011.05565

Staging energy sources to extend flight time of a multirotor UAV
Karan P. Jain, Jerry Tang, Koushil Sreenath, Mark W. Mueller
Published in International Conference on Intelligent Robots and Systems (**IROS**) 2020

Flying batteries: In-flight battery switching to increase multirotor flight time
Karan P. Jain, Mark W. Mueller
Published in International Conference on Robotics and Automation (**ICRA**) 2020

Modeling of aerodynamic disturbances for proximity flight of multirotors
Karan P. Jain, Trey Fortmuller, Jaeseung Byun, Simo A. Mäkiharju, Mark W. Mueller
Published in International Conference on Unmanned Aircraft Systems (**ICUAS**) 2019

Academic Achievements and Awards

- Received the UC Berkeley **Graduate Division Block Grant Award** for research activities in Summer 2019 as well as Summer 2020
- Awarded **Institute Technical Citation** 2018 by IIT Bombay for exemplary contribution towards institute technical activities from 2014-2018
- Grader and scrutinizer for the International Physics Olympiad (IPhO) - 2015
- Secured an **All India Rank** of **35** in the Joint Entrance Exam - Advanced 2014 among 1.4 million candidates; ranked 1st in Mumbai and 3rd in Maharashtra state

Professional Experience

Embedded systems and GNC Intern at **Zipline** May 2021 - August 2021
Worked on sensor characterization and analyzing thrust-torque margins for delivery drones

Modelling and Simulation Intern at **ideaForge, India** May 2018 - June 2018
Modelled a single-axis gimbal and designed a control mechanism for stabilizing a drone camera

R&D Intern at **Sysmex Corporation, Japan** May 2017 - July 2017
Developed image processing algorithms and contributed to the mechanical design of a **Compact Immunoassay Device** to detect levels of different hormones using ∼100 µL blood samples

Teaching Experience

Undergraduate Teaching Assistant at IIT Bombay for 5 courses:

Calculus	Autumn 2015-16	Basics of Electromagnetism	Spring 2015-16
Differential Equations	Spring 2016-17	Biology	Autumn 2017-18
Numerical Analysis	Spring 2017-18		

- Organized weekly tutorial sessions for about 50 freshmen on different topics pertaining to the course for making their concepts crystal clear
- Assisted the instructors in comprehensive and timely evaluation of the students

Product Development Experience

Design and Fabrication of an Electric Vehicle for Formula Student

Student Team Project, IIT Bombay Racing, IIT Bombay — August 2015 - May 2017
Advisor: Prof. Ramesh K. Singh

- Involved in the design, analysis, manufacturing and testing of the vehicle's powertrain
- Designed a compact, high-efficiency gearbox with a **38% YOY weight reduction**

*The team was conferred with **Formula Student Award** by IMechE for **three** consecutive years; awarded to only **2 out of 48** non-UK based teams.*

Design and Prototyping of an Exoskeleton suit for Flight

B.Tech. Project, IIT Bombay — July 2017 - July 2018
Guide: Prof. Arindrajit Chowdhury, Mechanical Engg. Dept., IIT Bombay

Involved in the development of an all-electric, compact, quiet single-passenger flying device

- Analyzed motor and propeller data to select the ones with high efficiency and thrust
- Selected Lithium-Polymer batteries based on energy and power density considerations
- Characterized the RPM-power-thrust response of contra-rotating propellers
- Designed a space-frame chassis to house the components and a passenger upto 90 kg in weight

Software Skills

Mathematical Analysis and Simulations	: MATLAB, Simulink
Programming Languages	: C++, Python
Robot Operating System (ROS)	
Computer Aided Design (CAD)	: SolidWorks, AutoCAD, Fusion 360
Computer Aided Engineering (CAE)	: ANSYS, MSC ADAMS
Computer Aided Manufacturing (CAM)	: G-code for CNC
General Purposes and Productivity	: MS-Excel, MS-Powerpoint, LaTeX
Content Creation	: Adobe Illustrator, Adobe Premiere Pro

Language Skills

- Fluent in English and Hindi
- Completed elementary level Chinese course at UC Berkeley (80 hours)
- Underwent basic Japanese language training (30 hours)

Extra-Curricular Activities

- Volunteered to teach underprivileged high school students in Mumbai in Summer 2016
- Hiking. Two of my favorites are Mt. Fuji (Japan) and Half Dome (Yosemite, California)
- Playing soccer, table tennis, ultimate frisbee, chess and video games