Education

Institute	Degree	Years
University of Pennsylvania	Ph.D. in Electrical and Systems Engineering	2012 - 2018
University of Pennsylvania	M.S.E. in Robotics	2010 - 2011
IIT Bombay	B.Tech. in Electrical Engineering	2004 - 2008

Skills

- Programming Languages: C++, C, Python, Rust
- Algorithms: Motion planning, Trajectory generation, Numerical Optimization, Geometric Computer Vision
- Frameworks and tools: ROS (1 & 2), OpenCV, Eigen, Boost, Git

Professional Experience

• Autel Robotics

At Autel Robotics, I have primarily worked on motion planning and vision-based state estimation for small aerial robots. The systems that I have developed are being used in 6 different models released in the market.

Director, Motion Planning (India)

- Supervise the development and provide technical guidance to improve the safety and smoothness of the motion of the robots in challenging tasks like powerline inspection and indoor navigation.
- Responsible for project planning, roadmap creation, and task assignment for the team.
- Awarded **Best Team** award for 2023.

Tech Lead, VIO and Motion Planning (India)

- Designed and developed the **entire motion planning stack**, enabling robots to navigate at speeds up to 15 m/s while avoiding obstacles. This includes an efficient mapping system, a multi-stage planner, trajectory generation, and also a robust simulation system for extensive testing and validation.
- Implemented a **tightly coupled visual-inertial odometry system using rolling shutter cameras** for accurate state estimation. Using rolling shutter cameras provides advantages in terms of size, cost, and dynamic range compared to traditionally used global shutter cameras.
- Awarded **Excellent Employee** award for 2022.

Research Scientist (California, USA)

- Implemented the core algorithms for a **high-altitude visual odometry system** that allows effective vision-based state estimation at altitudes exceeding 150 meters, ensuring reliable performance in challenging GPS-denied environments.
- Created an **online camera calibration system** to maintain calibration accuracy at run-time which improves robustness and ensures reliable operations in the field.
- Developed a loosely coupled visual-inertial odometry system for vision-based state estimation on robots with low computational resources.

Research Experience

• Micro Aerial Vehicles (UPenn, USA)

I have worked on the implementation of computer vision, state estimation, planning and control algorithms for small multirotor vehicles at **Prof. Vijay Kumar's** lab at the University of Pennsylvania. I was part of the Penn team involved in the DARPA Fast Lightweight Autonomy (FLA) program where we demonstrated high speed navigation in indoor and outdoor cluttered environments with small aerial robots. At the lab, I have also worked with teams of aerial robots and implemented a framework that lets a single operator control a team for 8–10 robots with very low cognitive load.

Achievements

- Silver Medallist at the 35th International Physics Olympiad (IPhO 2004) held in South Korea.
- Institute Colour (Technical Activities) for the year 2004–05, and Person of the Year (Technical Activities) for the years 2005–06 and 2006–07 at IIT Bombay.
- Institute Citation for contributions to technical activities throughout the stay at IIT Bombay.

Jun 2010 - Nov 2018

Nov 2021 - Dec 2022

Dec 2018 - Nov 2021

Jan 2023 – Now