Smit **Kesaria**

ROTOCIS ENGINEER · UAV DEVELOPER

Master of Technology - Systems & Control, Indian Institute of Technology Bombay

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"Fueled by curiosity, expertise, and a commitment to shaping the future of aerial robots."

Summary

Robotics and Embedded Engineer at e-Yantra, project under the **Ministry of Education**, with an experience **4** years. Involved in the development of **Quadcopter** platforms, proficiently executed the creation and oversight of **5** successful iterations of international robotics competitions in the theme of dornes. Served as a dedicated trainer and advisor to diverse technical teams within IIT Bombay. Passionately driven to construct innovative aircrafts and validate advanced control methodologies. **FPV drone pilot** with over **60 hours** flying experience

Work Experience

e-Yantra (By Ministry of Education)

IIT Bombay

ROBOTICS AND EMBEDDED SYSTEMS ENGINEER — *Oct. 2019 - Present*

- Orchestrated and supervised **5** editions of the e-Yantra International Robotics Competition in the domain of **Quadcopters** & **ROS**.
- Designed and fabricated over **20** Drones and VTOL, spanning a weight range from **250** grams to **20** kilograms.
- Conducted comprehensive training sessions on Embedded Systems for over 100 faculties from Engineering and Science colleges across various iterations of a two-day workshop.
- Managed and guided **33** interns for **13** Summer internship projects at IIT Bombay.
- Delivered impactful presentations as a **Speaker** for numerous workshops, aimed at training IIT Bombay students in ROS & Drone technologies.

Publications

Real-time gesture control UAV with a low resource framework

IRIA

INTERNATIONAL SYMPOSIUM OF ASIAN CONTROL ASSOCIATION ON INTELLIGENT ROBOTICS AND INDUSTRIAL AUTOMATION (IRIA) 2021 — *Sept 2021*

- Recipient of **best paper award** in International Symposium of Asian Control Association on Intelligent Robotics and Industrial Automation

MASTERS PROJECT & SEMINAR

Design, fabrication and control of an over-actuated multirotor

IIT Bombay

MASTERS THESIS PROJECT PROF. SUKUMAR SRIKANT — *Jul-Nov. 2022*

- Designing and fabricating a multirotor craft with **tiltable rotors** to achieve **5** independent degree of freedoms
- Deriving a **mathematical model** for dynamics of the system to verify **stability** & **controlability**
- Implementing a **model based control** to obtain 5 independent degrees of freedom over rotational and translation axes

Control of a Omni directional multirotor

IIT Bombay

SEMINAR — PROF. SUKUMAR SRIKANT — *Jul 2023 - Jul 2024*

- Implemented a **PID & LQR** based control system for controlling **6** independent degree of freedom for a Omni-directional Micro Aerial Vehicle and validated in Gazebo simulator using ROS

Industry Collaboration

Control of 2 DoF gimbal

IIT Bombay

TATA ADVANCED SYSTEMS | PROF. SUKUMAR SRIKANT — *Aug-Oct 2022*

- Implemented and Validated a **PID** based controller for 2 DoF camera gimbal for **defence application** in Gazebo simulator
- Interfaced and processed data from a high fidelity IMU sensor as feedback for controller

International Exposure

Commercial UAV Expo

Facebook Page

LAS VEGAS, USA — *Jan. 2015 - PRESENT*

- Participant at the **Commercial UAV Expo 2023**, which featured a gathering of **200** international exhibitors representing **75** diverse countries

Education

Indian Institute of Technology Bombay — *Mumbai, India*

M. Tech Systems & Control — *Jul. 2021 - Jun 2024*

K. J. Somaiya College of Engineering, University of Mumbai — *Mumbai, India*

B. Tech Electronics and Telecommunication — *Jul. 2015 - May 2019*

Positions of Responsibility

Senior Advisor | Innovation Cell, IIT Bombay — *UMIC, IIT Bombay*

Team AeRoVe — *Jul 2022 - Jun 2023*

- Served as a **Senior Advisor** to a dynamic team of more than **20** students engaged in international competitions such as **ICUAS** & **UAS**, centered around the innovative conception and construction of indigenous **Quadcopters**
- Offered valuable guidance by assessing and refining aspects of **Drone design**, including mechanical CAD models, avionics, control systems, planning strategies and the overall system architecture
- Demonstrated proficiency as an **experienced pilot**, responsible for testing an extensive array of self-assembled drones, showcasing an adept ability to manage a wide spectrum of drone technologies

Overall Advisor — *IIT Bombay*

Team Rakshak — *Jul 2022 - Jun 2023*

- Mentored and provided guidance to a team of over 20 students invloved in indigenous design and fabrication of **Quadcopters, planes and VTOLS** while participating in prestigious international competitions such as **SUAS**
- Offered expertise by advising and meticulously evaluating various aspects of the design, including mechanical CAD models, avionics, control systems, planning, and the overarching system architecture
- Utilized skills as an **experienced pilot** to conduct thorough testing of a diverse array of aerial vehicles

Team Lead | Inter IIT Tech meet — *IIT Bombay*

Inter IIT tech competition — *Mar 2022*

- Led the IIT Bombay team in **inter IIT Tech** challenge, competing within the **DRDO**-proposed **UAV guided UGV** problem statement.
- Attained a notable achievement by clinching the **Bronze medal** among the **13** participating IITs.

Associate Placement Coordinator — *IIT Bombay*

Placement Office, IIT Bombay — *Jul 2022 -Dec 2022*

- Felicitated with a Certificate of special mention in recognition of exceptional planning and execution
- Part of a **19**-membered managerial team, executed the end-to-end operations in hybrid campus placements for **400+** recruiters and **2200+** students
- Led a team of **250+** Interview coordinators to flawlessly orchestrate over **10,000** hybrid interviews spanning 15 Days
- Acted as the **sole point of contact** for over **50** companies across various business sectors throughout the recruitment process

Key Relevant Courses

Advanced Process Control	LQR, MPC, Kalman State Estimation
Intelligent Feedback and Control	Advanced techniques in PID, Multivariable controls, Industry standards for PID
Control of Nonlinear Dynamical Systems	Lyapunov stability anlysis, Nonlinear control techniques
Motion Planning and coordination	Path planning, multi-agent coordination
Modelling and Identification of Dynamical Systems	Lagrangian & data driven techniques for modelling

Extracurricular Activity

- Attended **ROS meetup** to foster connections with relevent industry players, robotics enthusiasts and academia for networking purpose
- Speaker & trainer for workshop on **ROS** in tech R&D expo at IIT Bombay
- Attended **PX4 Autopilot** Developer Summit 2021
- Speaker for technical sessions on **ROS & Quadcopters** on **YouTube**
- Participated in 3 day workshop on **Embedded systems** and **IoT** by **Texas Instruments**

Hobbies and Interests

Trekking | **Aerial Cinematography** | **Reverse engineering** | **Table Tennis** | **Volleyball**