Vikram Saini

Doctoral Student

Passionate about research and design of engineering systems

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EDUCATION

PhD (FLIGHT MECHANICS AND CONTROL)
INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

01/2021 - 2025 *CPI-9.2*

Courses

- Robust control Systems
- Space dynamics
- Autonomous navigation
- Digital Control
- Flight stability and control
- Unmanned aerial systems
- Nonlinear system
- Introduction to robotics

B. Tech (AEROSPACE ENGINEERING)
AMITY UNIVERSITY HARYANA

07/2016 - 07/2020 *CGPA-9.58*

Courses

- Measurement and control (sensors)
- Control systems
- Aircraft structures
- Mechatronics
- Aircraft stability and control
- Aircraft systems and instruments

WORK EXPERIENCE

INTERN
INSTITUTE OF AERONAUTICAL ENGINEERING, HYDERABAD

06/2018 - 07/2018

Achievements/Tasks

- WIND TUNNEL TEST SECTION CHARACTERIZATION

Contact : Prof. SHIVA KUMAR-AERODYNAMICS LAB

TRAINEE
TEIKYO UNIVERSITY

10/2018 - 10/2018 *JAPAN*

Achievements/Tasks

- TESTED IC ENGINE PERFORMANCE AND EMISSION CHARACTERISTICS ON BIO-DIESEL

Contact : PROF. MORI KAZUTOSHI - MORI LAB UTSUNOMIA CAMPUS

SKILLS

MATLAB | SIMULINK | C/C++ | CATIA | PYTHON | ROBOTICS | EMBEDDED SYSTEMS | LINEAR AND NONLINEAR CONTROL | KALMAN FILTERING | DIGITAL SIGNAL PROCESSING | IMAGE PROCESSING | MODEL BASED DEVELOPMENT

PROJECTS

DEVELOPMENT OF SPACECRAFT SIMULATOR (03/2021 - 2025)

- Dynamics modelling of 3-DOF simulator equipped with 4 variable speed control moment gyroscope using Simscape
- Extended Kalman filtering for attitude estimation in real-time using 9-axis IMU data
- Estimation of simulator inertia parameters and cg location using least squares
- DC and BLDC motor speed control using motor driver and ESC
- Simulator Attitude control using proportional derivative control strategy
- Designed wireless communication system to command the spacecraft simulator remotely using WiFi and serial communication

DUAL AXIS GIMBALED ELECTRIC THRUSTER BASED SPACECRAFT CONTROL (05/2022 - 08/2022)

- Studied the coupling between rigid body attitude dynamics and gimbaling motion of electric thruster
- Designed dynamic inversion based control law for relative attitude control between two spacecrafts in orbit
- Implemented relative attitude and position control using time scale separation principle

REACTION WHEEL DESATURATION USING MAGNETORQUER (02/2022 - 04/2022)

- Developed a novel strategy to desaturate reaction wheels on board a spacecraft using magnetic torque
- Designed a nonsingular terminal sliding mode attitude control algorithm

MARTIAN UAV DESIGN (04/2021 - 06/2021)

- Designed a coaxial tandem rotor UAV for martian atomsphere
- BEMT based rotor blade design
- Flight dynamics modelling and 6-DOF simulaton
- Navigation, guidance, and control architecture design

ROLLING AIRFRAME MISSILE CONTROL (01/2020 - 06/2020)

- Designed a robust controller using H-infinity method, simulated with damaged fins giving excellent control