



Education

PhD | Aerospace Engg.
UIUC | 2021-Present

- Research: Game Theory, Decision Making, Control
- Advisor: Cedric Langbort

MS | Aerospace Engg.
UIUC | 2019-20

- GPA: 4.00/4.00
- Thesis: Game Theoretic Model for Signaling in HRI

B. Tech | Aerospace Engg.
IIT Bombay | 2015-19

- CPI: 9.01/10.00 (with Honors)
- Minor in Systems and Controls Engineering
- Thesis: Optimal Sensing using Co-operative Ground Robots

Coursework

Controls

Optimal Control, Robust Control, Adaptive Control, State Estimation, Distributed Decision Theory

Decision and Information

Information Theory, Game Theory

Optimization & Stat

Statistical Learning Theory, Numerical Analysis, Optimization using Vector Space Methods, Random Processes

Technical Skills

Programming

python • MATLAB
c++ • c

Engg. Tools

Solidworks • ROS • Arduino
XFoil • Tecplot • AutoCAD
AVR Studio • Gazebo • RasPi

Languages

English • French • Hindi

Other Projects

Design of a controllable Frisbee
Triangulation method based
localisation of robots
Reinforcement learning crawler
bot

Research Experience

Role of Identity in Info Exchange and Decision Making
Guide: Prof. Cedric Langbort | UIUC

Illinois, USA
Jan 2021 - present

Social identity affects decision making and how receivers shape their beliefs after receiving new information. This work seeks to quantitatively model and understand this phenomenon with the aim of designing communication mechanisms robust to the deleterious effects of identity.

Stackelberg Signaling Game in Search-and-Rescue Context
Guide: Prof. Cedric Langbort | UIUC

Illinois, USA
Aug 2019 - Dec 2020

- Modelled a human robot interaction scenario in a game theoretic framework
- Designed an optimal signaling policy for the autonomous agent to influence human behaviour
- Robustified these signaling policies to uncertainties in the agent behaviour as well as environmental uncertainties

Optimal sensing using co-operative ground robots
Undergrad Thesis | Guide: Prof. Sukumar Srikant | IIT Bombay

Mumbai, INDIA
2018-2019

- Simulated convergence of consensus-based sensing algorithm to optimal configuration
- Implemented the decentralized consensus algorithm in non-holonomic bots, used RasPi and ROS network

Nonlinear Robust Control in Parrot Minidrones

Montréal, CANADA

Research Intern | Guide: David Saussié | Ecole Polytechnique

Summer 2018

- Identified the non-linear system model for Parrot Rolling Spider drone
- Designed a sliding mode controller (SMC) and an adaptive controller for the drone
- Obtained 3D helical trajectory tracking in presence of actuator saturation
- Used Simulink® Parrot Minidrone package
- Mitigated chattering effect in SMC using a modified, differentiable control law

Technical Experience

Control algorithm development in Pluto mini-drone
Student Developer | Drona Aviation

Mumbai, INDIA
Dec 2017 - Apr 2018

- Evaluated the flight capabilities of the Drona® Pluto mini-drone
- Implemented and tested various control algorithms and flight trajectories

Rakshak: Autonomous disaster-relief UAV Design Team
Junior Design Engineer | Instrumentation

Mumbai, INDIA
Oct 2015 - Dec 2016

- Automated the drone using Pixhawk module, aimed to participate at AUVSI SUAS
- Established communication links between the UAV and ground station over a ROS

2-Pi Mapper - Institute Technical Summer Project
SLAM implementation | Team of 4

Mumbai, INDIA
May 2016 - Jul 2016

- Implemented SLAM in a ground bot in a 2D grid using ultrasonic range sensors

Awards and Achievements

Robert Beatty fellowship for top incoming graduate students at UIUC [2019]
Academic Excellence Award for ranking 1st in the department [2018]
Kishore Vaigyanik Protsahan Yojna (KVPY) Fellowship [2014]
Awarded the prestigious AP grade for two courses; Aircraft Design and Flight Mechanics