JASMINE JERRY A

Robotics and Control Systems Enthusiast

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EDUCATION

Bachelor and Master of Technology (Dual Degree) Aerospace Engineering, Minor : Computer Science ⋆ $GPA : 9.44/10$

Indian Institute of Technology, Kharagpur **Jul 2017 – Ongoing**

EXPERIENCE / PROJECTS

1. FLYing maniPULATOR-Aerial Manipulation System, DAAD WISE Scholarship

Prof Klaus Janschek, Chao Yao, Institute of Automation, Technische Universität Dresden (TU Dresden) **May 2020 – Jun 2020**

- Contributed remotely to the FLYPULATOR project, an over-actuated multirotor UAV with an attached robotic arm.
- Studied non linear control theory, analysed the omnidirectional controllability and dynamics of existing system.
- Transitioned the project software stack from existing Robot Operating System (ROS1) framework to the latest ROS2 and optimised the code.

2. Multi-Hexarotor Collaborative Target Tracking Problem

Prof Debasish Ghose, Aditya Hegde, Aerospace Engineering, Indian Institute of Science (IISc) **Dec 2019 – Present**

- Implemented a range, pose and trajectory control for a pair of UAVs to move to a fixed target in ROS-Gazebo simulation environment.
- Used a camera based ArUco marker detection system to identify positions of different agents present without the need for inter-agent communication.
- Developed an obstacle avoidance mechanism using navigation vector fields for the agents to navigate known obstacles in simulation.

3. Study of Box Wing Design for Application in MAVs

Prof Sandeep Saha, Aerospace Engineering, IIT Kharagpur **Aug 2019 – Present**

- Studied the aerodynamics of a 'box-wing' model aircraft as a fixed wing Micro Aerial Vehicle (MAV) that has a better Lift to Drag ratio and improved stall characteristics. Results presented at the National Conference on Wind Tunnel Testing, Kanpur, Feb 2020. Paper
- Fabricated a scaled model and performed force and moment measurement experiments in subsonic wind tunnel. Video
- Performed numerical simulations on Aeolus and XFLR5 aero-software platforms to optimise the wing parameters in the design.

4. Pest Detection and Spraying through UAV Imagery using Semantic Segmentation and Genetic Algorithms

Prof NK Peyada, Aerospace Engineering IIT Kharagpur **Oct 2019 – Present**

- A joint project with the Department of Agricultural Engineering, to detect patches of infested crop and provide them local attention by spraying insecticide.
- Simulated an aerial robot to traverse in a crop field using a lawnmower trajectory, to locate the infested region, based on Semantic Segmentation method.
- Planned the trajectory, using evolutionary algorithms, to optimise time and the quantity of chemicals used, thus providing GPS waypoints to the autopilot to follow the planned trajectory.

5. Implementing Fuzzy Logic Control for PID to drive Robot Motor

Kharagpur RoboSoccer Students Group (KRSSG), IIT Kharagpur **Feb 2019 – June 2019**

- Developed and tested an optimized Fuzzy control code on STM Microcontroller for the RoboSoccer SSL Robots's BLDC motors using Mamdani approach.

PUBLICATIONS AND PAPERS

Box Wing: Aerodynamic Experimental Study for Applications in MAVs

Conference paper for the National Conference on Wind Tunnel Testing (NCWT-06), Kanpur **Feb, 2020**

Space Robotics versus Humans in Space

Conference paper for the Students' Session on the first IAA-ISRO-ASI Symposium on Human Spaceflight Programme, Bangalore **Jan, 2020**

Team Description Paper of KgpKubs, 2019 and 2020

Robocup Small Sized League

TECHNICAL SKILLS

Programming: C, C++, Python, MATLAB, HTML, CSS
Simulation: Gazebo, CARLA, Aeolus ASP
Libraries/Frameworks: ROS, OpenCV, NumPy, MATLAB/Simulink, MAVROS and PX4
Software Tools: Arduino, STM, Ansys, SolidWorks, Linux

ACTIVITIES & LEADERSHIP

Embedded Electronics Team Member & Public Relations Head, Kharagpur RoboSoccer Students Group (KRSSG)

Tested and integrated various motor drivers and control techniques for the RoboSoccer robots; Handled social media presence and sponsors **Mar 2018- Present**

Senior Editor, IIT Technology Ambit

A magazine start-up delivering latest research right from the pan Indian Institutes of Technology (IIT) with a readership of 5000+. **Sept 2019- Present**

ACHIEVEMENTS

1) **Awarded the DAAD Working Internships in Science and Engineering (WISE) Scholarship 2020**

By German Academic Exchange Service or DAAD (Deutscher Akademischer Austauschdienst)

- Also selected for the Engineering Summer Education Program 2020, School of Engineering, University of Tokyo and IAS Summer Research Fellowship, 2020.