Adeel Ahsan

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EXPERIENCE

Memorial University, St. Johns, Canada | *Graduate Research & Teaching Assistant*   Sep, 2023 - Present

- Nonlinear model predictive control design of a quadrotor
- Optimal waypoint navigation for a drone with dynamics and obstacle constraints
- Hardware in loop simulation setup for DJI M300 drone using ROS and OSDK
- Convex feasible corridor generation in a cluttered obstacles environment
- Convex Trajectory Optimization Algorithm for Fixed-Wing UAVs
- Bezier-Curve Based Path Planning for UAVs
- Teaching assistant for Mechatronics-I,II and Control Systems and Instrumentation, and CAE

Turkish Aerospace, Islamabad, Pakistan | *Control Design Engineer*   April, 2023 - Sep, 2023

- Programmatic trimming and linearization of nonlinear models
- Development of longitudinal and lateral flight control design for a fighter jet aircraft
- Autonomous landing system design and safe-landing region prediction
- Software and hardware in loop testing

Advanced Rocket Technologies, London, UK | *GNC Engineer (Part Time)*   Jan, 2023 - Sep, 2023

- Development of nonlinear 6 DOF flight simulator and control design for a sounding rocket

National Engineering & Scientific Commission | *Assistant Manager*   Aug, 2021 - April, 2023

- Development of 6 DOF nonlinear flight simulators for different aerospace systems
- Design and development of flight control system for aerial vehicles
- Software in loop testing of controllers in embedded C++ code
- System identification of actuators and dynamical models of aerospace systems
- Technical report writing and documentation of these projects, and testing procedures

AZoNetwork | *Technical Writer*   Jan, 2022 - Oct, 2022

- Writing technical articles on robotics, AI, sensors, and nanotechnology
- Conducting observational studies to improve understanding and content
- Creating customized marketing-aligned content based on client needs

National Engineering & Scientific Commission | *Intern*   July, 2020 - Aug, 2020

- Mathematical modeling and development of 6 DOF simulation for a quadrotor
- Implemented various control strategies including loop shaping, PID, LQI, and H-infinity on a quadrotor
- Implementation and flight testing for different control strategies on APM 2.8 autopilot
- Calibration, pre and post flight testing of APM 2.8 based quadrotor

EDUCATION

Memorial University of Newfoundland, Canada   Sep, 2023 - Present

Master of Engineering in Electrical Engineering

- Major: Optimal Trajectory Planning and Control Design of a Quadrotor

Institute of Space Technology, Pakistan   August 2021

Bachelor of Science in Aerospace Engineering   *GPA: 3.75/4.0*

- Thesis: Robust Control of a Quadrotor: An ADRC Approach

Skills

- MATLAB/Simulink
- Nonlinear Flight Simulator Development
- Flight Control Design
- Nonlinear and Linear Optimization
- Optimal Guidance and Navigation
- Convex Optimization
- Linear Controls
- Robust Controls
- Trajectory Optimization
- Path Planning
- Image Processing

- Drones
- Flight Dynamics
- Nonlinear Dynamic Inversion Control
- Nonlinear Model Predictive Control
- PID / LQR / LQI / Lead - Lag Controllers
- C/C++
- Python
- Pixhawk/PX4 Integration with MATLAB
- DJI OSDK & ROS
- Drone Pilot

Awards

Fellow of the School of Graduate Studies   October, 2024
This award is made in recognition of continued academic excellence throughout the program

Vice Chancellor's Gold Medal   August 2021
Awarded a Vice Chancellor's Gold Medal for the best final year project

Government Fellowship Award   August 2018
Completed Bachelor's degree at IST under a fully funded Government fellowship

Chief Minister's Laptop Award   Sep 2017
Awarded a Chief Minister's laptop for excellent performance in Matriculation exams

Publications

- M. A. Ahsan, H. Zeeshan Iqbal Khan, J. Rajput and J. Riaz, "Active Disturbance Rejection Control of a Quadrotor: A Comparative Study," 2022 19th International Bhurban Conference on Applied Sciences and Technology (IBCAST), Islamabad, Pakistan, 2022, pp. 444-450.