Adeel Ahsan

aeronautyy.com adeelahsaanawan maahsan@mun.ca

Work Experience

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

- Nonlinear model predictive control design of a quadrotor
- Extended state extended Kalman filter based NMPC control of quadrotor
- Optimal waypoint navigation for a drone with dynamics and obstacle constraints
- Convex safe corridor generation in cluttered obstacle environments (no-fly zones)
- Convex trajectory optimization algorithm for fixed-wing UAVs and drones
- Hardware-in-the-loop simulation setup for DJI M300 using ROS & OSDK
- Trajectory planner and controller implementation with HITL simulations
- Learning quadrotor dynamics using feed-forward neural networks with ReLU
- Physics-informed NN for quadrotor dynamics by embedding rigid-body ODEs in the training loss

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

Teaching Experience

2025 (Spring)	Mechatronics II; Instrumentation — *TA*	*Memorial University*
2025 (Winter)	Mechatronics I; Control Systems I — *TA*	*Memorial University*
2024 (Fall)	Computer-Aided Engineering — *TA*	*Memorial University*
2024 (Summer)	Control Systems II; Instrumentation — *TA*	*Memorial University*
2024 (Winter)	Mechatronics I — *TA*	*Memorial University*

Education

Memorial University of Newfoundland, Canada Sep, 2023 - Present
Master of Engineering in Electrical Engineering *GPA: 4.0/4.0*
- Major: Model-Based Optimal Trajectory Planning, Optimization 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.

Ocean Idea Challenge Award November, 2024
For winning a startup idea challenge in solving ocean related problem.

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.