

MINHYUK JANG

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Education

- Seoul National University (SNU)** **Mar. 2019 – PRESENT**
B.S. in Mechanical Engineering, Interdisciplinary Major in Artificial Intelligence *Seoul, South Korea*
- **GPA : 3.99/4.0**, Outstanding B.S. Thesis Presentation Award
 - Relevant Coursework: Nonlinear System Theory (Graduate, A+), Advanced Control Techniques (A+)
 - 18 months of military service included

Research Interests

- Control Theory (Robust Control, Optimal Control, Learning-Based Control, Adaptive Control, Nonlinear Control)
- Safety Guarantee, Safety-Critical Systems (Multirotor, VTOL, Robotics, etc), Multi-Agent Systems

Publications

- **Minhyuk Jang**, Astghik Hakobyan, and Insoon Yang. ***Distributionally Robust Control and State Estimation for Linear Stochastic Systems***, **IEEE Transactions on Automatic Control (TAC)**, (under review), [[arXiv](#)]
- **Minhyuk Jang**. *Stability Analysis of Disturbance Observer under Model Uncertainty with Different System Degrees between True and Nominal Systems*, Institute of Control, Robotics and Systems (**ICROS**), 2024

Experience

- SNU Control and Optimization Research (CORE) Lab** **Mar. 2023 – PRESENT**
Research Intern - Advisor: Prof. Insoon Yang *Seoul, South Korea*
- Developed unified algorithm for Distributionally Robust Control and State Estimation in partially observable linear stochastic systems, addressing ambiguities in probability distributions of disturbances and measurement noise
 - Formulated a tractable semidefinite programming problem that iteratively determines the worst-case covariance matrices of all uncertainties, significantly enhancing the scalability and efficiency of the proposed algorithm
- NEARTHLAB** **Jan. 2024 – Feb. 2024**
Aerospace Engineering Intern, GNC Team *Seoul, South Korea*
- Implemented DOB and LQR based position/velocity controllers in C++&ROS2 and tested through Gazebo simulation
 - Integrated a flight controller with a companion computer for quadrotor offboard control, implemented DOB+LQR and DOB+PID trajectory tracking controllers, and conducted extensive outdoor flight experiments

Selected Projects (See more at [HERE](#))

- Automated Hyperparameter Tuning Algorithm for MPPI Control** **Sep. 2023 – Jun. 2024**
Outstanding B.S. Thesis Presentation Award *Seoul, South Korea*
- Designed an adaptive algorithm to automatically adjust the hyperparameter (Inverse temperature) for MPPI control
 - Implemented the algorithm in the MuJoCo MPC (MJPC) framework, improving control performance, reducing state fluctuations and control costs, and enabling smoother trajectories in quadrotor hovering and racing tasks
- VTOL (Vertical Take-off and Landing) Projects** **Mar 2024 – Sep 2024**
Team Leader – Korea Robot Aircraft Competition (Grand Award) *Taejeon, South Korea*
- Constructed two A-tail Quadplane VTOLs with autonomous flight capabilities, each with wingspans of 1.5m and 2.0m
 - Oversaw the full system engineering process, from selecting electronic components (servos, motors, flight controller, batteries, GPS, PDB, RC, etc.) to wiring, sensor calibration, and mission task planning
- AIAA Design/Build/Fly (DBF) Competition** **Sep. 2024 – PRESENT**
Control Team *Tucson, AZ, USA (2025)*
- Developed landing algorithm for a glider launched from a mothership at a 100m altitude, with a 250g weight limit
 - Modified and tested Ardupilot soaring algorithm, followed by outdoor flight experiments to validate performance and ensure accurate landing on a target location

Leadership / Extracurricular activities

Bulnabi - SNU Drone Club

Sep. 2023 – PRESENT

Team Leader

Seoul, South Korea

- Organized and conducted over five Quadrotor Build/Fly seminars, teaching hardware assembly, sensor calibration, Ground Control Station usage, flight experiments, and flight log analysis
- Led a 25-member team for the Korea Robot Aircraft Competition, focusing on VTOL system design and autonomous flight missions; conducted over 30 outdoor fixed-wing missions and successfully stabilized all flight phases.

KATUSA (Korean Augmentation to the United States Army)

Sep. 2021 – Mar. 2023

Squad Leader – Sergeant, 8th Army, Camp Humphreys

Pyeongtaek, South Korea

- Led and managed a 10-solider squad, ensuring their training, well-being, and mission preparedness
- Provided essential translation and interpretation support during Combined Exercises, leveraging language proficiency
- Engaged in daily collaboration with American colleagues within a U.S. Army office

G.I.V - SNU Volunteering Club

Mar. 2019 – Sep. 2020

Vice President

Seoul, South Korea

- Delivered educational support in math, science, and art to teenagers in rural areas, emphasizing experiential learning
- Organized and engaged in various volunteer activities, including secondhand markets, mural painting, and food drives

Talks

- **Invited Talks:** *Design and Development of a Lightweight, 3D-Printed VTOL Aircraft with Autonomous Flight Capabilities for Advanced Air Mobility (AAM)*, UVS Symposium, Daejeon, South Korea, 2024

Honors / Awards

Grand Award - Korea Robot Aircraft Competition

2024

1st Place among 39 University Teams

Minister of Commerce, Industry and Energy

Outstanding B.S. Thesis Presentation Award

2024

Department of Mechanical Engineering

Seoul National University

Outstanding Materials and Manufacturing Processes Award

2024

Materials and Manufacturing Processes Contest

Seoul National University

Excellence Award - Mechatronics Competition

2023

Department of Mechanical Engineering

Seoul National University

ARCOM (Army Commendation Medal)

2022

United States Department of the Army

Camp Humphreys

Kwanjeong Scholarship

2021

Recipient of a full tuition scholarship along with a stipend for two years

Kwanjeong Educational Foundation

Merit-based Scholarship

Spring 2020, Fall 2020

Department of Mechanical Engineering

Seoul National University

Technical Skills

Programming: C/C++, Python, MATLAB (Simulink)

Libraries/Softwares: PX4-Autopilot, ROS2, Gazebo, Arduino, MuJoCo, PyTorch, SolidWorks, L^AT_EX

Hardware Skills: Drone operation, soldering and wiring, laser cutting, 3D printing