

# MINHYUK JANG

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## Education

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University of Illinois Urbana-Champaign (UIUC) Aug. 2025 – Present  
*Ph.D. Student in Mechanical Engineering - Advisor: Prof. Naira Hovakimyan*

Seoul National University (SNU) Mar. 2019 – Feb. 2025  
*B.S. in Mechanical Engineering (Robotics Track), Interdisciplinary Major in Artificial Intelligence*

- Summa Cum Laude (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

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

## Publications

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- Minhyuk Jang, Astghik Hakobyan, and Insoon Yang. *On the Steady-State Distributionally Robust Kalman Filter*, IEEE Control and Decision Conference (CDC), 2025, [\[arXiv\]](#)
- Minhyuk Jang, Astghik Hakobyan, and Insoon Yang. *Distributionally Robust Control and State Estimation for Linear Stochastic Systems*, [\[arXiv\]](#)
- 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

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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, a game-theoretic approach to stochastic optimal control handling inaccurate data-driven disturbances and noise distributions
- 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](#))

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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)* Taean, 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

## Leadership / Extracurricular activities

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### 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

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- **Invited Talks:** *Design and Development of a Lightweight, 3D-Printed VTOL Aircraft with Autonomous Flight Capabilities*, Center for Scientific Innovation and Education (CSIE), Yerevan, Armenia, 2024, (online)
- **Invited Talks:** *Design and Development of a Lightweight, 3D-Printed VTOL Aircraft with Autonomous Flight Capabilities for Advanced Air Mobility (AAM)*, Unmanned Vehicle Systems Symposium, Daejeon, South Korea, 2024

## Honors / Awards

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### College of Engineering Outstanding Graduate Award

2025

*One of the Top 24 Graduates across the entire College of Engineering*

*SNU College of Engineering Alumni Association*

### 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

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

**Libraries/Softwares:** PX4-Autopilot, ROS2, Gazebo, Arduino, MuJoCo, PyTorch, Fusion 360, SolidWorks, L<sup>A</sup>T<sub>E</sub>X

**Hardware Skills:** Drone operation, FPV drone piloting, soldering and wiring, laser cutting, 3D printing