Juyeop **Han**

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Research Interest

- Filling gap between theory and real-world application in robotics and multi-agent system
- Guaranteeing safety with robotic perception and learning
- Versatile robotic operation in dynamic environment

Education

Korea Advanced Institute of Science and Technology (KAIST) — *Daejeon, S.Korea*

Master's Student in Aerospace Engineering — *Mar. 2021 - Present*

- GPA: 3.92/4.0

Seoul National University (SNU) — *Seoul, S.Korea*

B.S. in Mechanical and Aerospace Engineering — *Mar. 2015 - Feb. 2021*

- GPA: 3.83/4.0, **Summa Cum Laude**
- Leave of Absence for Mandatory Military Service (2017 - 2019)

Publications

• **[C3]** **J. Han***, Y.Min*, B.Jeong, H.Chae and H.Choi. *"DS-K3DOM: 3-D Dynamic Occupancy Grid Mapping with Kernel Inference and Dempster-Shafer Evidential Theory"* (*equal contribution) **(In Preperation)**.

• **[C2]** **J. Han**, and H.Choi. *"Computation of Tight Forward Reachable Set for a Multirotor based on the Nonlinear Adaptive Controller"* **(In Preperation)**.

• **[C1]** **J. Han**, M. Tahk, and H. Choi, *"Pseudospectral method-based safe motion planning for quadrotors in a cluttered environment" AIAA Science and Technology Forum* (Scitech), 2022.

Research Experience

Lab for information and Control Systems — *Daejeon, S.Korea*

Research Assistant | Advisor: Prof. Han-Lim Choi, KAIST — *Jan. 2021 – Present*

- Proposed algorithm for **kernel-based 3-dimensional dynamic occupancy grid map (DS-K3DOM) [C3]** using Dempster-Shafer evidential theory.
- Proposed method for **real-time computation of tighter forward reachable set (FRS) of multirotor [C2]** combining nonlinear adaptive controller with Hamilton-Jacobi reachability analysis for agile and safe trajectory planning.
- Planned **optimal trajectory in cluttered environment for quadrotors [C1]** using pseudo-spectral method and safety flight corridor .
- Led research projects funded by KAIST institutes (KI) for robotics and Agency for Defense Development(ADD).
- Was in charge of installing motion capture system and sensors for hardware experiments in the lab.

Innovative Design and Integrated Manufacturing Lab — *Seoul, S.Korea*

Research Intern | Advisor: Prof. Sung-Hoon Ahn, SNU — *Jun. 2020 – Aug. 2020*

- Conducted thesis research on planning path of 6 DOF robot actuator for surface cleaning boustrophedon cell decomposition and developing surface detection module for RGBD-camera with AR tags.

Review Activities

- IEEE Control System Letters (L-CSS), 2022

Skills

Programming	C/C++, Python, MATLAB
Libraries & Tools	ROS, CUDA, Pytorch, LaTeX, SolidWorks
Languages	Korean (Native), English (Fluent, 2 years in U.S. military, GRE 157/168/3.5)

Honors & Awards

Awards

Dec. 2019	**Outstanding Award**, SNU ME Materials and Manufacturing Process Course	*Seoul, S.Korea*
Jun. 2019	**Participation Award**, Seoul Hackathon, Administration of Seoul	*Seoul, S.Korea*
Dec. 2015	**Creative Award**, SNU ME Creative Engineering Design Course	*Seoul, S.Korea*

Scholarships

2021 - Present	**Government-Funded Scholarship**, 90% Tuition, KAIST	*Seoul, S.Korea*
Spring 2020	**SNU Alumni-Funded Scholarship**, Full Tuition, SNU Alumni Foundation	*Seoul, S.Korea*
Spring 2017	**Merit-Based Scholarship**, USD 1,000, SNU Foundation	*Seoul, S.Korea*
2016	**Merit-Based Scholarship**, Full Tuition, SNU	*Seoul, S.Korea*
Fall 2015	**Merit-Based Scholarship**, 50% Tuition, SNU	*Seoul, S.Korea*

Extracurricular Activity

2nd Infantry Divison, US Army — *Pyeongtaek, S.Korea*

Unit Supply Specialist, Sergeant — *Nov. 2017 – Aug. 2019*

- Served in military as Korean augmentation to the United States army(KATUSA) agent.
- Managed unit supply in air ambulance company.
- Partly was in charge of COC (Change of Command) inspection and ARMS inspection

DALISHA (SNU Running Crew) — *Seoul, S.Korea*

Leadership Faculty — *Sep. 2018 - Feb. 2021*

- Led running during COVID-19.
- Managed accounting in the crew.