

KANGHYUN RYU

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EDUCATION

- University of Illinois at Urbana-Champaign(UIUC)** Aug 2022 - Present
Ph.D. in Aerospace Engineering Champaign, IL
- Graduate Student in Intelligent Control(ICON) lab
- Seoul National University (SNU)** Mar 2016 - Aug 2022
B.S. in Aerospace Engineering Seoul, Korea
- Summa Cum Laude
 - Military Service (Leave of absence) Jul 2018 – Jun 2020

PUBLICATIONS

Conference Papers

K. Ryu, J. Kang, and D. Lee, "Performance Comparison between EKF and UKF in GPS/INS Low Observability Conditions", *The 21th International Conference on Control, Automation, and Systems (ICCAS)*, 2021. [Link]

RESEARCH EXPERIENCE

- Intelligent Control(ICON) Laboratory** Aug 2022 - Present
Graduate Research Assistant Champaign, IL
- Model-based Reinforcement Learning(RL) for safe control of quadrotor
- Making Innovative Space Technology (MIST) Laboratory** Aug 2021 – Dec 2021
Undergraduate Research Intern, Advised by Prof. Giovanni Beltrame Montréal, Canada (Remote)
- Developed a multi-spectral saliency detection code based on global contrast saliency detection algorithm
 - Contributed to a ROS package processing Micasense multi-spectral image in DJI manifold
- Interactive & Networked Robotics Laboratory (INRoL)** Oct 2020 – Jun 2021
Undergraduate Research Intern, Advised by Prof. Dongjun Lee Seoul, Korea
- Analyzed observability of GPS/INS system in drone motion primitives
 - Compared the performance gap between EKF and UKF on partially observable maneuvers
 - Presented to the 2021 International Conference on Control, Automation, and Systems (ICCAS)
- Rocket Propulsion Laboratory** Mar 2018 – Dec 2018
Undergraduate Research Program, Advised by Prof. Youngbin Yoon Seoul, Korea
- Developed a laser optical system for sounding rocket launch system igniting solid rocket propellant
 - Conducted computational structure analysis of launch system by Solidworks

HIGHLIGHTED PROJECTS

- Comparison of Path Planning Algorithms in Non-holonomic Constraint** May 2021 - Jun 2021
"Decision Making for Autonomous Aerospace System", Instructed by Prof. Hyounjin Kim Seoul, Korea
- Coded RRT*, PRM*, and FMT* algorithm with MATLAB
 - Compared the computation time and path cost of algorithms in reeds-shepp car
- AI System Design Contest** Aug 2020 – Dec 2020
Seoul National University, Department of System Semiconductor Engineering for AI Seoul, Korea

- Trained YOLO-v3 object detection model with drone-captured images
- Worked on hyperparameter tuning and data augmentation
- Achieved 2nd highest mean Average Precision in the contest

2019 Spaceport America Cup

Avionics team member

Nov 2018 – Jun 2019
Spaceport America, NM

- Developed avionics system for 10,000ft solid rocket
- Implemented extended Kalman filter on Raspberry Pi module for fusing GPS, IMU, and altimeter

EXPERIENCES

SNU AI Institute, Center for Industrial Collaboration

Research Intern

Jan 2022 – Present
Seoul, Korea

- Writing research abstract reports of AI research faculty for member companies
- Working on building communication channel between corporate and AI research faculty

SK Hynix Summer Internship

DRAM Packaging R & D Intern

Jul 2020 – Aug 2020
Icheon, Korea

- Improved dicing quality by proposing a new singulation process
- Inspected wafer with Auto-Visual-Inspection (AVI) and Scanning Electron Microscope (SEM)
- Presented “Low-k HBM Laser+Blade Saw Set up development” project

SNU Student Rocket Team HANARO Vice-President

Advised by Prof. Youngbin Yoon

Sep 2017 – Aug 2018
Seoul, Korea

- Developed a solid rocket system with target apogee 3,000ft, Organized design criteria and managed sub-teams
- Developed a new AN-based rocket propellant for high thrust rocket
- Achieved 1st Prize in 27th National Universities’ Rocket Engineering Competition, 2018

AWARDS & HONORS

Scholarships

Robert Beatty Fellowships

Awarded to top incoming aerospace graduate students

Aug 2022 - Present

National Science and Engineering Undergraduate Scholarship

Awarded by Korean Government (Full tuition)

Mar 2018 - Aug 2022

International Research Intern Scholarship

Awarded by Polytechnique Montréal (\$3,100)

Oct 2021

Study Abroad Scholarship (Stanford Summer Session)

Funded by SNU the Office of International Affairs (\$4,000)

Jun 2020

Project Grants

Grant for Undergraduate Research Program

Funded by Research Affairs of SNU (\$7,000)

Mar 2018

Grant for Science Culture Activities (Space Challenger Camp)

Funded by Korea Foundation for the Advancement of Science & Creativity (\$7,000)

Apr 2017

TEACHING

Compressible Fluid Dynamics tutoring for Aerospace Engineering junior student	Spring 2021
Calculus tutoring for College of Engineering freshmen	Winter 2021
Space Challenger Camp Director	Summer 2017
Developed New Rocket Camp for high school students	