LinkedIn Website

JACKIE LEE

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SUMMARY

Controls Engineer with research experience in vehicle dynamics, control systems, battery management optimization and autonomous robotics. | Expert in C/C++, Python, Simulink, CATIA V5, UAV Control, ROS, Ardupilot.

EDUCATION

Texas A&M University Texas, US
Ph.D. in *Mechanical Engineering* *Aug. 2022 – Present*

- Full-tuition Scholarship for five years

Kyungwoon University Gumi, Korea
B.S. in *Unmanned Aerial and Autonomous Vehicle Engineering* (GPA: 3.9/4.0) *Mar. 2018 – Feb. 2022*

- *Summa Cum laude*. Merit-based Scholarship with Highest Honors for three semesters
- Full-tuition Scholarship for four years; National Science and Engineering Scholarship, Ministry of Education

TECHNICAL SKILLS

Programming Languages

- C/C++
- Python
- MATLAB, Simulink
- Automation Control Design
- Optimization tool: Gurobi
- Scheduling problems, Path planning problems
- Battery Management Optimization System

Operating Systems

- ROS
- Linux, Windows, Mac OS

Manufacturing Skills

- Proficient in soldering, mechanical assembly.
- Hands-on experience with prototyping, testing, and refining multi-copter dynamic modeling.
- 3D modeling: CATIA V5

EXPERIENCE

Texas A&M University, Autonomous Systems Lab College Station, Texas, US
Research Assistant (Advisor: Dr. Sivakumar Rathinam) *Aug. 2022 – present*

Network Based Data Analysis in Intelligent Transportation Systems

- Collaborated with **cross-functional teams** in Robotics and Control Engineering group to integrate control algorithms into autonomous vehicles, leading to a 50% improvement in system efficiency.
- Implemented and tested **real-time control algorithms in C++** for autonomous vehicles systems, enhancing real-time response and stability in dynamics conditions with drones and Clearpath vehicles.

DEVCOM Army Research Lab *Aug. 2022 – Jul.2024*

Multi-Agent Path Planning and Scheduling Problem for Surveillance System

- Devised a simulation using **python** applied by heuristic path planning algorithm made for multi-vehicles.
- Formulated **battery management scheduling algorithm using Gurobi**, optimizing vehicle scheduling, the number of vehicles and charging stations required for visiting over various terrains by battery constraints.

Kyungwoon University, Autonomous and Intelligence Robotics Lab Gumi, Korea

Independent Project: Downsized PAV tri-eVTOL

Project Leader (Advisor: Professor Myung-rae Ham) *Sept. 2020 – Nov. 2021*

- Led 8 members in the 2021 International PAV Technology Contest, designing and controlling a downsized Hyundai PAV eVTOL with **12 motors** and won a **$13,000 award**.

- Designed tri-eVTOL with CATIA V5, incorporating dynamic characteristics into the model, and developed a control system for **convergence tilting** system using PX4 autopilot.

Independent Project: Development of Launch-type Foldable Quad Copter
Project Leader (Advisor: Dr. Ho-jun Shim) *Mar. 2021 – Jun. 2021*

- Created **launch-type foldable drone** mortar dynamics mechanism and control system using Pixhawk C++.

AM System Inc. Daejeon, Korea
Research Intern (Advisor: Dr. Young-ik Kim) *Jan. 2021 – Feb. 2021*

- Developed a hand-layered carbon composite drone, including its 3D model, and designed a Raspberry Pi drone with its control system using MAVproxy, enhancing structural dynamics and control efficiency.

LEADERSHIP EXPERIENCE

Korean-American Scientists and Engineers Association (KSEA) College station, Texas
President *Aug. 2022 – Jul.2024*

- Hosted academic events organization efforts at Texas A&M University while actively fostering collaborations with other institutions to expand event reach.

Kyungwoon University Club Grin-Narae Gumi, Korea
Founder and President *Mar. 2019 – Dec. 2020*

- Development of modular drones to be used on land, sea, and the air.
- Developed "Non-face-to-face Emergency Rescue PAVs that Keep the Golden Hour" for the 2020 Prospective Start-up Package Support Project organized by the Korea Institute of Startup & Entrepreneurship Development.
- Produced a new lightweight quadcopter applying materials for DJI Inspire 2 drone with funding provided by the Korea Expressway Corporation, after winning its selection as a Designated University Startup Club in 2020.

Field of UAV Engineering Student Council Gumi, Korea
Vice President *Mar. 2019 – Feb. 2020*

- Organized "Used Book Drive" activity to pass down used books and to save the environment and reduce costs.

AWARDS & HONORS

- ***Second Place*, UKC 2024 Poster Presentation Award**
  - J. Lee, S. Rathinam, (Aug. 2024), New Meta-heuristic Approach Algorithm for a Self-Rechargeable Team of Unmanned Aerial-Ground Vehicles, 34th US-Korea Conference, CA, USA.
- ***Summer Research Grant 2024*, Texas A&M University Mechanical Engineering**
  - Competitive grant supports my summer research on advancing on-progress path planning algorithms and applying them to real-world robotics experiments (Jun. 2024).
- ***Hanwha Aerospace CEO Award*, the Third National University Student Capstone Contest**
  - J. Lee, H. Nar, J. Park (Nov. 2021), Poster Presentation at the Society for Aerospace System Engineering, The Third National University Student Capstone Contest, Gyeongju, Korea.
- ***Second Place*, 2021 International PAV Technology Contest**
  - Won $13,000; Downsized Hyundai PAV eVTOL (using 12 motors) dynamics and control.

PUBLICATIONS

- Lee, J. J., Kumar, N., Rathinam, S., Darbha, S., Sujit, P. B., & Raman, R. "The Persistent Robot Charging Problem for Long-Duration Autonomy," *arXiv preprint arXiv:2409.00572*, 2024. (IEEE R-AL)
- Lee, J.J., Rathinam, S., "A Meta-Heuristic Approach for an Aerial-Ground Vehicle Path Planning Problem," AIAA SCITECH 2024 Forum, Jan. 2024.

CERTIFICATION

- *Certified Remote Pilot: Unmanned Aircraft General – Small (UAG)*, Issued by Department of Transportation Federal Aviation Administration, Oct 2022
- *Certified Ultralight Vehicle Pilot*, Issued by Korea Transportation Safety Authority, June 2020