Dongkyu **Lee**

Master Candidate · Robotics

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Interests

Exploration & Path Planning
Reinforcement Learning
Decision Making

Education

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

M.S. in Robotics Program *Sep. 2021 - PRESENT*

- Researching robotics in URL (Urban Robotics Lab), Advisor H.Myung.

University of Seoul *Seoul, S.Korea*

B.S. in Electrical and Computer Engineering *Mar. 2016 - Aug. 2021*

- Got the National Scholarship for Science and Engineering awarded to students with outstanding academic performance in those field.

Publications

M-BRIC: Design of Mass-driven Bi-Rotor with RL-based Intelligent Controller *UR2022*

Dongkyu Lee, Eungchang Mason Lee, Duckyu Choi, and Hyun Myung *Under review*

Experience

ETRI (Electronics and Telecommunications Research Institute) *Daejeon, S.Korea*

Research Intern *Jan. 2021 - Feb. 2021*

- Researched at the Human Enhancement and Augmentation Technology Laboratory of Artificial Intelligence Center.
- Responsible for the development of motor control by applying reinforcement learning in the walking aid robot project.
- Compared traditional PID controller and RL-based end-to-end controller.

Software Maestro (funded by Korea Ministry of Science and ICT) *Seoul, S.Korea*

Software Engineer Trainee *May. 2020 - Dec. 2020*

- Selected as 11th Software Maestro for the national software developer training course through the selection process.
- Performed research on face detection AI and developed the concentration analysis algorithm based on the facial expression change.
- Applied for a KR patent for an improved P2P real-time online class solution using AI face analysis.
- [YouTube]

Honors & Awards

International

2020	**3rd Award, Korea Robot Industry Association President's Award**, SRC IRC International Intelligent Creative Robot Comopetition	*S.Korea*
2019	**4th Award, Engineering Dean's Award**, SRC IRC International Intelligent Wrestling Robot Competition	*S.Korea*
2016	**1th Award, Minister of Trade, Industry and Energy Award**, SRC IRC International Intelligent Wrestling Robot Competition	*S.Korea*

Domestic

2020	**Encouragement Award**, IEIE (The Institute of Electronics and Information Engineers)	*S.Korea*
2020	**Academic Excellence Award**, University of Seoul	*S.Korea*
2017	**3rd Award, Engineering Dean's Award**, Dankook University National Line Tracer Competition	*S.Korea*
2016	**Academic Excellence award**, University of Seoul	*S.Korea*

Projects

Wall Climbing Robot

4 Person Team

Team Leader — *Aug. 2020 - Oct. 2020*

- Developed a wall-climbing articulated robot using electromagnets by mimicking the movements of lizards and blue crabs.
- Recognized for creativity by applying the concept of delivering urgent relief goods at low risk to disaster sites in the city.
- [YouTube], [Shorts]

Design of The Automatic Fan Switching System.

3 Person Team

Team Leader — *Aug. 2020 - Nov. 2020*

- Designed a whole system using only circuit design (none MCU) to minimize power consumption for ventilation which helps in the Covid-19 situation.
- Recognized for creative circuits, simulation validations, and real circuit implementations.

Wrestling Robot

4 Person Team

Team Leader at 2019 — *Aug. 2019 - Oct.2019*

Core Member at 2016 — *Aug. 2016 - Oct. 2016*

- Developed a wrestling robot that pushes opponents into traps or pushes them out of the field.
- Implemented whole system using STM32F407IG and novel algorithm to preempt an advantageous position.
- [YouTube]

Intelligent Self-Driving Model Car

5 Person Team

Member — *Feb. 2017 - Jun. 2017*

- Autonomous driving by recognizing lanes
- Developed the self-driving model car that completes missions such as dotted lane change, obstacle avoidance, hill driving, emergency stop, and unpaved roads.
- Conducted motor control to avoid obstacles on the road.
- Developed tracking algorithm that the camera can track the far lane to predict the course.

Master & Slave Robot

2 Person Team

Member — *Jan. 2017 - Aug. 2017*

- Developed the mobile robot (Slave) that can chase the lineTracer (Master) very closely without any avoidance even intersection or round curve.
- Developed linear tracking equation and virtual position to avoid collisions at intersections or circular curves.
- [YouTube]

Line Tracer Robot

Personal Project

Done Alone — *Mar. 2016 - Aug. 2017*

- Implemented a mobile robot that can follow the line on the map very fast.
- Developed mapping algorithm using markers so that the robot can adjust the adaptive control input according to the course of the map.
- [YouTube]