

Yongseok Kwon

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EDUCATION

University of Michigan

M.S.E in Mechanical Engineering, GPA: 4.0/4.0

Ann Arbor, MI

Aug. 2020 – Aug. 2022

Ulsan National Institute of Science and Technology (UNIST)

B.S. in Mechanical Engineering, Human Factors Engineering, GPA: 3.94/4.3

Ulsan, Republic of Korea

Mar. 2016 – Feb. 2020

- Honors: *Summa Cum Laude*

PUBLICATIONS

1. Jonathan Michaux, Qingyi Chen, **Yongseok Kwon**, Ram Vasudevan. “Reachability-based Trajectory Design with Neural Implicit Safety Constraints.” *Robotics: Science and Systems*, Daegu, Republic of Korea, 2023.

EXPERIENCE

Korea Army Research Center for Future and Innovation, Republic of Korea Army

Feb. 2023 – Present

Robot Researcher

- Proposed and coordinated national defense projects related to unmanned systems for search and reconnaissance.

ROAHM Lab, University of Michigan

Jul. 2021 – Jan. 2023

Ford Center for Autonomous Vehicles, University of Michigan

Jun. 2022 – Jan. 2023

Research Assistant & Research Engineer

Advisor: Prof. Ram Vasudevan

- Developed a Python framework for parallel reachable set computation, achieving a 2,000-fold speed improvement over non-parallel methods.
- Incorporated neural signed distance functions into receding horizon trajectory planning for articulated robots, enhancing safety constraints.

Locomotor Control Systems Lab, University of Michigan

Jan. 2021 – May 2021

Graduate Student Researcher

Advisor: Prof. Robert D. Gregg IV

- Tested an extended Kalman filter-based gait state estimator along with a neural gait measurement model on an open-source robotic leg.

Bio-Robotics and Control (BiRC) Lab, UNIST

Mar. 2019 – Jul. 2019

Undergraduate Research Intern

Advisor: Prof. Joonbum Bae

- Designed a novel decoupling mechanism for tendon-driven multi-link robots.
- Managed various components of a hydraulic robot arm, including electric circuitry, link assembly, hydraulic actuators, and encoder testing.

COURSE PROJECTS

Transformers for Motion Planner, University of Michigan

Aug. 2021 – Dec. 2021

Course: Intro. to Robotic Manipulation

Advisor: Prof. Nima Fazeli

- Deployed the decision transformer for a multi-link arm reaching task.

Model Predictive Control for Autonomous Car, University of Michigan

Aug. 2021 – Dec. 2021

Course: Self Driving Car

Advisor: Prof. Ram Vasudevan

- Formulated convexified collision avoidance constraints for trajectory planning in car racing scenarios.

UAV Navigation via Dubins Path Planning, UNIST

Mar. 2019 – Jun. 2019

Course: UAV Flight Control & Simulation

Advisor: Prof. Hyondong Oh

- Implemented a Dubins-curve-based RRT to generate dynamically feasible paths for UAVs under kinodynamic constraints.

SKILLS

Programming

Python, MATLAB

Software

IPOPT, Gurobi, MuJoCo

Frameworks & Others

Pytorch, Weights & Biases, Linux, Conda, Git

HONORS & AWARDS

National Science and Engineering Scholarship, Korea Student Aid Foundation (KOSAF)

2018 – 2019

- Full-tuition scholarship for the last two years of undergraduate studies

Academic Performance Scholarship, UNIST

2016 – 2017

- Full-tuition scholarship for the first two years of undergraduate studies