Yongseok Kwon

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Education

University of Michigan — Ann Arbor, MI
M.S.E in Mechanical Engineering, GPA: 4.0/4.0 — Aug. 2020 – Aug. 2022

Ulsan National Institute of Science and Technology (UNIST) — Ulsan, Republic of Korea
B.S. in Mechanical Engineering, Human Factors Engineering, GPA: 3.94/4.3 — 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 Inovation, Republic of Korea Army — Feb. 2023 – Present
Robot Researcher
- Proposed and coordinated national defense projects related to unmanned system for search and rescue

ROAHM Lab, University of Michigan — Jul. 2021 – Jan. 2023
Research Engineer — Advisor: Prof. Ram Vasudevan
- Developed a python framework for a parallel reachable set computation via polynomial zonotope 2,000 time faster than non-parallel computation
- Incorporated a neural signed distance function of trajectory parameterized reachable sets of articulated robots as safety constraints into receding horizon trajectory planner

Locomotor Control Systems Lab, University of Michigan — Jan. 2021 – May 2021
Graduate Student Researcher — Advisor: Prof. Robert D. Gregg IV
- Tested the extended Kalman filter-based gait state estimator on the open-source robotic leg
  –Built a neural implicit representation of the gait measurement model
  –Incorporated task variables in the gait state variables

Bio-Robotics and Control (BiRC) Lab, UNIST — Mar. 2019 – Jul. 2019
Undergraduate Research Intern — Advisor: Prof. Joonbum Bae
- Designed a decoupling mechanism for tendon-driven multi-link robots
  –Reduced complexity of mechanism with wider adaptability to tendons
- Managed components of hydraulic robot arm
  –Manipulated electric circuit, assembled link and hydraulic actuator, and examined encoder

Course Projects

Transformers for Motion Planner, University of Michigan — Aug. 2021 – Dec. 2021
Course: Intro. to Robotic Manipulation — Advisor: Prof. Nima Fazeli
- Applied decision transformer on multi-link arm reaching task

Trajectory Optimization for Autonoumous Car, University of Michigan — Aug. 2021 – Dec. 2021
Course: Self Driving Car — Advisor: Prof. Ram Vasudevan
- Formulated convexified collision avoidance constraints for trajectory planning of car racing

UAV Navigation via Dubins Path Planning, UNIST — Mar. 2019 – Jun. 2019
Course: UAV Flight Control & Simulation — Advisor: Prof. Hyondong Oh
- Implemented Dubins-curve based RRT to generate dynamically feasible path for UAV 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*

Overseas Studies Scholarship, UNIST — 2018
- *Received $4,200 as a financial support for a summer session at UC Irvine*

Academic Performance Scholarship, UNIST — 2016 – 2017
- *Full-tution scholarship for the first two years of undergraduate studies*