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 Innovation, Republic of Korea Army — Feb. 2023 – Present
Robot Researcher
- Proposed and coordinated national defense projects focused on unmanned reconnaissance systems.

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-tution scholarship for the first two years of undergraduate studies*