Senior Researcher (ETRI, Korea)

YOUNGSUN KWON

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Research Interest

- Real-time occupancy mapping
- Deep learning for 3-D reconstruction
- Sensor-based motion/path planning

Experience

2025. 03. – present	Senior Researcher at ETRI (Electronics and Telecommunications Research Institute), Daejeon, Korea
2023. 01. – 2025. 02.	Researcher at ETRI (Electronics and Telecommunications Research Institute), Daejeon, Korea
2022. 03. – 2022. 12.	Post-doc at KIST (Korea Institute of Science and Technology), Seoul, Korea

Education

2016. 02. – 2022. 02.	Ph.D., School of Computing, KAIST (advisor: Sung-Eui Yoon)
2014. 03. – 2016. 02.	M.S., Robotics Program, KAIST (advisor: Sung-Eui Yoon)
2010. 03. – 2014. 02.	B.S., Electronic & Electrical Engineering, Sungkyunkwan University
2010. 03. – 2014. 02.	B.S., Computer Engineering, Sungkyunkwan University (double major)

Publications

ICTC 2024	Online Terrain Mapping for Exploring Dense Forests on Unmanned Aerial Vehicles, **Youngsun Kwon**, Suseong Kim, Youkyung Hong, Sanghyouk Choi, Jihun Cha, International Conference on Information and Communication Technology Convergence (ICTC) 2024
Aerospace 2024	Safe and Efficient Exploration Path Planning for Unmanned Aerial Vehicle in Forest Environments, Youkyung Hong, Suseong Kim, **Youngsun Kwon**, Sanghyouk Choi, Jihun Cha, Aerospace 2024
RA-L 2024	CCTV-Informed Human-Aware Robot Navigation in Crowded Indoor Environments, Mincheul Kim, **Youngsun Kwon**, Sebin Lee, and Sung-Eui Yoon, IEEE Robotics and Automation Letters (RA-L) 2024
ICSR 2023	User Perception of the Robots' Error in Heterogeneous Multi-Robot System Performing Sequential Cooperative Task, Soyeon Shin, **Youngsun Kwon**, Yoonseob Lim, and Sonya S. Kwak, The 15th International Conference on Social Robotics (ICSR) 2023
IROS 2023	Heterogeneous Robot-assisted Services in Isolation Wards: A System Development and Usability Study, **Youngsun Kwon**, Soyeon Shin, Kyonmo Yang, Seongah Park, Soomin Shin, Hwawoo Jeon, Kijung Kim, Guhnoo Yun, Sangyong Park, Jeewon Byun, Sang Hoon Kang, Kyoung-Ho Song, Doik Kim, Dong Hwan Kim, Kapho Seo, Sonya S. Kwak, and Yoonseob Lim, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2023
ICCAS 2022	PTZ Camera Control on Robot Telemedicine Service for Infectious Diseases, Seongah Park, **Youngsun Kwon**, and Yoonseob Lim, The 22nd International Conference on Control, Automation and Systems (ICCAS) 2022
ICCAS 2022	Group Estimation for Social Robot Navigation in Crowded Environment, Mincheul Kim, **Youngsun Kwon**, and Sung-Eui Yoon, The 22nd International Conference on Control, Automation and Systems (ICCAS) 2022
ICRA 2022	Implicit LiDAR Network: LiDAR Super-Resolution via Interpolation Weight Prediction, **Youngsun Kwon**, Minhyuk Sung, and Sung-Eui Yoon,

	IEEE International Conference on Robotics and Automation (ICRA) 2022
Dissertation	Real-time Dense Occupancy Mapping using Spatial Correlation of Point Clouds, **Youngsun Kwon** (adviser: Sung-Eui Yoon), Ph.D. Thesis (School of Computing, KAIST) 2022
T-RO 2021	Diffraction- and Reflection-Aware Multiple Sound Source Localization, Inkyu An, **Youngsun Kwon**, and Sung-Eui Yoon, IEEE Transactions on Robotics (T-RO) 2021
IROS 2021	Dynamic Humanoid Locomotion over Rough Terrain with Streamlined Perception-Control Pipeline, Moonyoung Lee, **Youngsun Kwon**, Sebin Lee, JongHun Choe, Junyong Park, Hyobin Jeong, Yujin Heo, Min-su Kim, Jo Sungho, Sung-Eui Yoon, and Jun-Ho Oh, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2021
IROS 2020	Adaptive Kernel Inference for Dense and Sharp Occupancy Grids, **Youngsun Kwon**, Bochang Moon, and Sung-Eui Yoon, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2020
ICRA 2020	Robust Sound Source Localization considering Similarity of Back-Propagation Signals, Inkyu An, Byeongho-Jo, **Youngsun Kwon**, Jung-woo Choi, and Sung-Eui Yoon, IEEE International Conference on Robotics and Automation (ICRA) 2020
SII 2020	Real-time 3-D Mapping with Estimating Acoustic Materials, Taeyoung Kim, **Youngsun Kwon**, and Sung-Eui Yoon, IEEE/SICE International Symposium on System Integration (SII) 2020
ANBRE 2019	An Objectness Score for Accurate and Fast Detection during Navigation, Hongsun Choi, Mincheul Kang, **Youngsun Kwon**, and Sung-Eui Yoon, The 2019 World Congress on Advances in Nano, Bio, Robotics and Energy (ANBRE) 2019
T-RO 2019	Super Rays and Culling Region for Real-Time Updates on Grid-based Occupancy Maps, **Youngsun Kwon**, Donghyuk Kim, Inkyu An, and Sung-Eui Yoon, IEEE Transactions on Robotics (T-RO) 2019
UR 2018	Adaptive Lazy Collision Checking for Optimal Sampling-based Motion Planning, Donghyuk Kim, **Youngsun Kwon**, and Sung-Eui Yoon, International Conference on Ubiquitous Robots (UR) 2018
UR 2018	Automated Task Planning using Object Arrangement Optimization, Mincheul Kang, **Youngsun Kwon**, and Sung-Eui Yoon, International Conference on Ubiquitous Robots (UR) 2018
ICRA 2018	Dancing PRM*: Simultaneous Planning of Sampling and Optimization with Configuration Free Space Approximation, Donghyuk Kim, **Youngsun Kwon**, and Sung-Eui Yoon, IEEE International Conference on Robotics and Automation (ICRA) 2018
ICRA 2017 Workshop	Ray Distribution to Parallel Batching-based Updates, **Youngsun Kwon** and Sung-eui Yoon, IEEE International Conference on Robotics and Automation (ICRA) 2017 Workshop on Robotics and Vehicular Technologies for Self-driving cars
ICRA 2016	Super Ray based Updates for Occupancy Maps, **Youngsun Kwon**, Donghyuk Kim, and Sung-Eui Yoon, IEEE International Conference on Robotics and Automation (ICRA) 2016

Awards

Outstanding Technical Achievement	Development and integration of robot systems for isolation treatment facilities, Artificial Intelligence and Robotics Institute, KIST 2022

Outstanding PhD Thesis	Real-time Dense Occupancy Mapping using Spatial Correlation of Point Clouds, School of Computing, KAIST 2022
1st place	Real-time Updates for Occupancy Maps, Korea Compute Congress (KCC) 2017 SW Implementation/Demo Contest (Microsoft Research Award)
2nd place	Speech-To-Text Chess, Samsung SDS SW Club Championship 2013
1st place	Robot Soccer: Mirosot 5 vs 5, International Robot Contest (IRC) 2013 FIRA Challenge Cup (Ministry of Trade Industry & Energy Award)
Commendation	FIRA RoboWorld Cup and FIRA Korea Cup (Robot Soccer: Mirosot 5 vs 5), Sungkyunkwan University 2011 Fall
3rd place	Robot Soccer: Mirosot 5 vs 5, FIRA RoboWorld Cup 2011
1st place	Robot Soccer: Mirosot 5 vs 5, FIRA Korea Cup
Commendation	FIRA Challenge Cup (Robot Soccer: Mirosot 5 vs 5), Sungkyunkwan University 2011 Spring
1st place	Mirosot 5 vs 5, International Robot Contest (IRC) 2010 FIRA Challenge Cup (Prime Minister Award)

Activities

PROGRAMMING SKILLS

- Language: C/C++, Python, JAVA, MATLAB
- Robot Operating System (ROS 1 & 2)
- Deep learning framework (PyTorch)

S.I.O.R. (SUNGKYUNKWAN INSTITUTE OF ROBOT): CLUB FOR MAKING ROBOTS

- 2012 Leader of S.I.O.R.
- Robot Soccer: Mirosot
- Robot Soccer: Teen-Size Humanoid
- 2010 ~ 2013 S.I.O.R. Exhibition: Line Tracer, LED Electric Piano, Drawer, Speech-To-Text Chess