

Youngseok Kim

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EDUCATION

- Ph.D. in Mobility, KAIST** (*Advisor: Dongsuk Kum*) 2023
- Thesis: *3D Object Detection via Multi-Sensor Fusion for Autonomous Driving*
 - Honors: *KAIST College of Engineering PhD Dissertation Award*
- M.S. in Mobility, KAIST** (*Advisor: Dongsuk Kum*) 2019
- Thesis: *Deep Learning based Vehicle Position and Orientation Estimation via Inverse Perspective Mapping Image*
- B.S. in Mechatronics Engineering, KoreaTech** (*Advisor: Sangsoon Lee*) 2017
- Honors: *cum laude*

EMPLOYMENT

- 42dot**, computer vision research engineer 2023 -
- Develop perception system for autonomous driving

PUBLICATIONS

International

- [1] **Youngseok Kim**, Juyeb Shin, Sanmin Kim, In-Jae Lee, Jun Won Choi, and Dongsuk Kum
CRN: Camera Radar Net for Accurate, Robust, Efficient 3D Perception
IEEE/CVF International Conference on Computer Vision (ICCV), 2023
- Ranked 1st among camera-radar methods on nuScenes detection benchmark as of March 2023
- [2] Sanmin Kim, **Youngseok Kim**, In-Jae Lee, and Dongsuk Kum
Predict to Detect: Prediction-guided 3D Object Detection using Sequential Images
IEEE/CVF International Conference on Computer Vision (ICCV), 2023
- [3] **Youngseok Kim**, Sanmin Kim, Jun Won Choi, and Dongsuk Kum
CRAFT: Camera-Radar 3D Object Detection with Spatio-Contextual Fusion Transformer
AAAI Conference on Artificial Intelligence (AAAI), 2023
- Ranked 1st among camera-radar methods on nuScenes detection benchmark as of July 2022
- [4] **Youngseok Kim**, Sanmin Kim, Juyeb Shin, Jun Won Choi, and Dongsuk Kum
CRN: Camera Radar Net for Accurate, Robust, Efficient 3D Perception
International Conference on Learning Representations Workshop (ICLRW) on Scene Representations for Autonomous Driving, 2023
- [5] Sihwan Hwang, Sanmin Kim, **Youngseok Kim**, and Dongsuk Kum
Combining Semi-Supervision and Active Learning via 3D Consistency for 3D Object Detection
IEEE/RSJ International Conference on Robotics and Automation (ICRA), 2023
- [6] **Youngseok Kim**, Sanmin Kim, Sangmin Sim, Jun Won Choi, and Dongsuk Kum
Boosting Monocular 3D Object Detection with Object-Centric Auxiliary Depth Supervision
IEEE Transactions on Intelligent Transportation Systems (T-ITS), 2022
- Ranked 1st/3rd among published monocular methods on KITTI BEV/3D detection benchmark as of April 2021
- [7] Sangmin Sim, **Youngseok Kim**, and Dongsuk Kum
Sequential Image-based 3D Object Detection with Location Refinement
IEEE International Conference on Pattern Recognition (ICPR), 2022
- [8] **Youngseok Kim**, Jun Won Choi, and Dongsuk Kum
GRIF Net: Gated Region of Interest Fusion Network for Robust 3D Object Detection from Radar Point Cloud and Monocular Image
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020

- [9] Jinhyeong Kim*, **Youngseok Kim***, and Dongsuk Kum
Low-level Sensor Fusion Network for 3D Vehicle Detection using Radar Range-Azimuth Heatmap and Monocular Image
 Asian Conference on Computer Vision (ACCV), 2020
- [10] **Youngseok Kim** and Dongsuk Kum
Deep Learning based Vehicle Position and Orientation Estimation via Inverse Perspective Mapping Image
 IEEE Intelligent Vehicles Symposium (IV), 2019
 - Oral presentation, 5.8% acceptance rate

Domestic

- [1] Sanmin Kim, **Youngseok Kim**, Hyeongseok Jeon, Dongsuk Kum, and Kibeom Lee
Autonomous Driving Technology Trend and Future Outlook: Powered by Artificial Intelligence
 Transactions of Korean Society of Automotive Engineers (Trans. KSAE), 2022
- [2] **Youngseok Kim** and Dongsuk Kum
 Vehicle Distance Estimation using Convolutional Neural Network on Inverse Perspective Mapping Image
 Korean Society of Automotive Engineers Annual Conference (KSAE), 2019
- [3] **Youngseok Kim** and Dongsuk Kum
 Fault Tolerant Vehicle Detection Using Camera-LiDAR Sensor Fusion: Multi-channel Faster R-CNN
 Korean Society of Automotive Engineers Annual Conference (KSAE), 2018

PATENTS

International

- Dongsuk Kum, **Youngseok Kim**, “Electronic Device for Perceiving Three-Dimension Environment based on Camera and Radar, and Operating Method Thereof,” US, Application Number: 18/502,678
- Dongsuk Kum, **Youngseok Kim**, “Electronic Device for Obtaining Three-Dimension Object Based on Camera and Radar Sensor Fusion, and Operating Method Thereof,” US, Registration Number: 17199043, DE, PCT, Application Number: 10 2021 106 518.6, PCT/KR2021/002916

Domestic

- Dongsuk Kum, **Youngseok Kim**, “Electronic Device for Perceiving Three-Dimension Environment based on Camera and Radar, and Operating Method Thereof,” KR, Application Number: 10-2023-0096379
- Dongsuk Kum, **Youngseok Kim**, “Electronic Device for Obtaining Three-Dimension Object Based on Camera and Radar Sensor Fusion, and Operating Method Thereof,” KR, Registration Number: 10-2168753-0000
- Dongsuk Kum, **Youngseok Kim**, “Simultaneous Traffic Participants Detection and Localization vis Bird’s Eye View Image,” KR, Registration Number: 10-2003387-0000
- Dongsuk Kum, **Youngseok Kim**, Seoung Jun Lee, “Distance Measuring Device Using Mono Infrared Camera and Method Thereof,” KR, Registration Number: 10-1918887-0000

RESEARCH EXPERIENCES

Graduate Research Assistant at *VDC (Vehicular systems Design and Control) Lab, KAIST* 2017-2023

- Develop 3D object detection using camera-radar, camera, and LiDAR in outdoor driving scene
- Deploy 3D object detector using LiDAR and traffic light detector using camera
- Manage autonomous driving vehicle team to build a vehicle platform
- Organize overall autonomous driving demonstration and test driving at KAIST campuses and K-City

Teaching Assistant at *AbuDhabi Polytechnic, UAE* Spring 2015

- Assist tutorials and laboratories of Circuit Theory and Mechanical Engineering Laboratory classes
- Grade lab reports and assignments, and held office hours

AWARDS AND HONORS

2024	KAIST College of Engineering PhD Dissertation Award [Link]
2022	KAIST Research Highlights of 2022 [Link]
2021	KAIST Breakthroughs (Research Webzine of the KAIST College of Engineering) [Link]
2021	2 nd Place, Object Tracking Challenge for Autonomous Driving, RideFlux (sponsored by Korea Ministry of Science and ICT)
2012 - 2017	Graduation with honors: <i>cum laude</i> , Korea University of Technology and Education Full tuition scholarship (5 semesters), 50% tuition scholarship (2 semesters)
2014	Grand Prize and Popularity Award, Robot Capstone Challenge, Korea Institute of Industrial Technology

SKILLS

- **Language:** Korean (Native), English (Proficient)
- **Programming Languages:** Python, MATLAB, Basics of C++
- **Tools/Library/Software:** PyTorch, OpenCV, ROS, LaTeX, Ubuntu, FFmpeg, Git

ACADEMIC SERVICE

Reviewer

- Conference: AAAI, CVPR, ECCV, ICRA, IROS, ITSC, IV
- Journal: IJAT, NeuroComputing, RA-L, T-ITS, T-IV, TPAMI

Invited Talks

- SKKU Applied AI & Computer Vision Lab: Towards LiDAR-level 3D Object Detection using Camera and Radar Oct 2023
- ADD (Agency for Defense Development): Sensor Fusion for Robust 3D Object Detection Sep 2023
- Qualcomm Korea: Towards LiDAR-level 3D Object Detection using Camera and Radar Jun 2023
- Gachon Univ. Autonomous Mobility Systems Lab: From 2D to 3D Monocular Perception Apr 2023
- KAIST Future Mobility Conference: Towards LiDAR-level 3D Object Detection using Camera and Radar Feb 2023
- KATECH (Korea Automotive Technology Institute): From 2D to 3D Monocular Perception Dec 2022
- Qualcomm USA&Korea: Camera-Radar 3D Object Detection with Spatio-Contextual Fusion Transformer Oct 2022

REFERENCES

Available on request