Yecheol Kim

Ph.D candidate

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Overview

Research interest areas:

- Deep Learning-based Perception
- 3D Perception using Single / Multi Modalities
- Annotation / Computation Efficient Learning

Education

Ph.D. in Electrical Engineering (*Advisor: Prof. Jun Won Choi*) Mar 2020 - Aug 2024
Hanyang University, Seoul, South Korea

M.S. in Electrical Engineering (*Advisor: Prof. Jun Won Choi*) Mar 2018 - Feb 2020
Hanyang University, Seoul, South Korea

B.S. in Electrical Engineering (*Advisor: Prof. Jun Won Choi*) Mar 2014 - Feb 2018
Hanyang University, Seoul, South Korea

International Olympiad in Informatics Training Course Mar. 2011 - Dec. 2012

Work Experience

Autonomous Driving Development Team, Kakao Mobility Mar 2021 - Aug. 2021
Engineering Intern

- Constructed LiDAR-based 3D object detection dataset in the Pangyo area
- Developed and ported a real-time LiDAR-based 3D object detection model to ROS environment

Publications (* indicates equal contributions)

Fine-Grained Pillar Feature Encoding via Spatio-Temporal Virtual Grid for 3D Object Detection
IEEE International Conference on Robotics and Automation (ICRA), 2024.
Konyul Park*, **Yecheol Kim***, Junho Koh, Byungwoo Park and Jun Won Choi
Computation Efficient, LiDAR, 3D Object Detection

Semi-Supervised Domain Adaptation Using Target-Oriented Domain Augmentation for 3D Object Detection

Under Review

Yecheol Kim*, Junho Lee*, Changsoo Park, Hyoungwon Kim, Inho Lim, Christopher Chang, and Jun Won Choi
Semi Supervised Domain Adaptation, LiDAR, 3D Object Detection

3D Dual-Fusion: Dual-Domain Dual-Query Camera-LiDAR Fusion for 3D Object Detection

Under Review

(Ranked 5th place on nuScenes 3D Detection leaderboard of December 2022 among single model)
Yecheol Kim, Konyul Park, Minwook Kim, Dongsuk Kum, and Jun Won Choi
Transformer, Camera-LiDAR Fusion, 3D Object Detection

Joint 3D Object Detection and Tracking using Spatio-Temporal Representation of Camera Image and LiDAR Point Clouds

AAAI Conference on Artificial Intelligence (AAAI), 2022.

Junho Koh*, Jaekyum Kim*, Jinhyuk Yoo, **Yecheol Kim**, Dongsuk Kum, and Jun Won Choi
Temporal, Camera-LiDAR Fusion, 3D Object Detection

3D-CVF: Generating joint camera and LiDAR features using cross-view spatial feature mapping for 3D object detection

European Conference on Computer Vision (ECCV), 2020

(Ranked 4th place on KITTI 3D car detection leaderboard of March 2020)
Jin Hyeok Yoo*, **Yecheol Kim***, Jisong Kim and Jun Won Choi
Cmaera-LiDAR Fusion, 3D Object Detection

Enhanced Object Detection in Bird's Eye View using 3D Global Context Inferred from Lidar Point Data

IEEE Intelligent Vehicles Symposium (IV), 2019.

Yecheol Kim, Jaekyum Kim, Junho Koh, and Jun Won Choi
LiDAR, 3D Object Detection

Robust Deep Multi-Modal Learning based on Gated Information Fusion Network

Asian Conference on Computer Vision (ACCV), 2018.

Jaekyum Kim, Junho Koh, **Yecheol Kim**, Youngbae Hwang, and Jun Won Choi
Robustness, Multi-Modal, 2D Objeect Detection

Robust Camera Lidar Sensor Fusion via Deep Gated Fusion Network

IEEE Intelligent Vehicles Symposium (IV), 2018. *(among 5% selected as single track oral presentation)*

Jaekyum Kim, Jaehyung Choi, **Yecheol Kim**, Junho Koh, Chung Choo Chung, and Jun Won Choi
Robustness, Camera-LiDAR Fusion, 2D Object Detection

Projects (Selected)

Semi-supervised domain adaptation for 3D object detection

Kakao Mobility · Jan 2022 - Jan 2023

- Design Semi-Supervised Domain Adaptation (SSDA) algorithm for LiDAR-based 3D object detection
- Adapt the SSDA algorithm from the nuScenes dataset to the kakao dataset collected in Pangyo

Research on 3D detection of dynamic objects based on Camera and LiDAR sensor fusion

Qualcomm · Sep 2019 - Mar 2022

- Design Camera-LiDAR Sensor Fusion Algorithm for 3D Object Detection
- Design spatio-temporal Camera-LiDAR fusion algorithm for joint detection and tracking
- Achieve state-of-the art performance on KITTI 3D detection and 2D tracking dataset

Obstacle Sensing Algorithm Using Mono Camera Attached to Power Swing Doors

Hyundai Motors · Mar 2021 - Dec 2021

- Collect the depth and video raw data using stereo camera
- Design the depth estimation and collision detection algorithm for surrounding environment of vehicles
- Deploy the AI collision avoidance algorithm to NVIDIA Jetson AGX Xavier
- Optimize the obstacle sensing model using the TensorRT library

Video Object Detection using Spatio-Temporal Information

SK Telecom · Jun 2019 - Mar 2020

- Design the 2D video object detection algorithm based on spatio-temporal information
- Achieve state-of-the-art performance on the ILSVRC VID dataset

Object Recognition Technology using Camera and Lidar Sensor

Hyundai Motors · Sep 2018 - Feb 2019

- Design the LiDAR-based 2D and 3D object detection algorithm using KITTI dataset
- Modify the LiDAR-based algorithm to the sensor fusion-based 2D and 3D object detection algorithm

Patents

[P1] "Deep Learning-Based Sensor Fusion Information Generation Technique Using Dual Queries in a Multi-Modal Environment" kr, 10-2022-0178992

Computer Skills

Languages: Python, C++, C
Deep Learning Tools: Pytorch, Tensorflow, Caffe

Language Skills

Korean: Native language
English: Fluent (reading), Intermediate (speaking, writing)

Reference

Prof. Jun Won Choi

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E-mail: junwchoi@hanyang.ac.kr

Web: https://www.spa.hanyang.ac.kr

Relationship: B.S - Ph.D advisor in Hanyang University