Junho Koh

Ph.D candidate

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Overview

Research interest areas:

- Perception for intelligent vehicles and mobile robots
- LiDAR and camera based 3 dimensional object detection
- Sensor fusion-based perception
- Object tracking and video object detection

Education

Ph.D. in Electrical Engineering (*Advisor: Prof. Jun Won Choi*) Mar 2020 - Present
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

Publications (* indicates equal contributions)

MGTANet: Encoding Sequential LiDAR points using long short-term motion-guided temporal attention for 3D object detection
AAAI Conference on Artificial Intelligence (AAAI), 2023 (ranked 3rd among LiDAR methods on nuScenes detection benchmark as of August 2022)
Junho Koh*, Junhyung Lee*, Youngwoo Lee, Jaekyum Kim, and Jun Won Choi

D-Align: Dual Query Co-Attention Network for 3D Object Detection based on Multi-Frame Point Cloud Sequence
IEEE International Conference on Robotics and Automation (ICRA), 2023.
Junhyung Lee, **Junho Koh**, Youngwoo Lee, and Jun Won Choi

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

Joint Representation of Temporal Image Sequences and Object Motion for Video Object Detection

IEEE International Conference on Robotics and Automation (ICRA), 2021.

Junho Koh*, Jaekyum Kim*, Younji Shin, Byeongwon Lee, Seungji Yang, and Jun Won Choi

Video Object Detection using Object's Motion Context and Spatio-Temporal Feature Aggregation

IEEE International Conference on Pattern Recognition (ICPR), 2020.

Junho Koh*, Jaekyum Kim*, and Jun Won Choi

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

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

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

Projects

3D Multi-Object Tracking based on LiDAR-Camera Sensor Fusion in Rough-Terrain

Hanwha Aerospace · Mar 2022 - May 2023

- Collect and label the 3D object detection and tracking data in rough-terrain
- Design the LiDAR-Camera sensor fusion 3D object detection algorithm
- Develop the fusion-based tracking algorithm adapted by Kalman Filter algorithm

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

Autonomous Driving Systems based on End-to-End Learning

Hyundai Mobis · May 2017 - Dec 2017

- Design the end-to-end steering wheel angle prediction model using only a single camera
- Deploy the inference model on the NVIDIA Drive PX2
- Take a driving test on the Hyundai Mobis proving ground

Patents

[P1] "Deep Leaning-based Video Object Detection using Temporal Information" kr, 10-2224218

Review Experiences

IEEE Transactions on Vehicular Technology.
IEEE Transactions on Intelligent Transportation Systems.
Neurocomputing

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

Department of Electrical Engineering at Hanyang University, Seoul

E-mail: junwchoi@hanyang.ac.kr

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

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