

# Do Gyoon Lee

Machine Learning Engineer, Computer Vision Expert

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## EDUCATION

### Yonsei University | College of Engineering

MS/Ph.D in Electrical Electronics Engineering

Seoul, Korea

Mar. 2019-Present

GPA: 4.14 / 4.3 (Expected graduation: Feb. 2025)

Relevant Coursework: Neural Network, Random Process, Statistical Pattern Recognition, Special Topics in Deep Learning  
Probabilistic Robotics, Digital Image Processing, Machine Learning and Its Application

### Yonsei University | College of Engineering

BE in Electrical Electronics Engineering

Seoul, Korea

Mar.2012-Feb.2019

GPA: 3.04 / 4.3

Relevant Coursework: Probability and Random Variables, Data Structure and Algorithms, Introduction Artificial Intelligent,  
Engineering Mathematics(I-IV), Computer Architecture, Signal and Systems, Digital Signal Processing, Communication Theory

## RESEARCH EXPERIENCE

### 3 dimensional Multi-Object Detection and Tracking with Single & Multi LiDAR

Jan.2020-Dec.2021

Yonsei University | Mando

Korea

- Led a project developing the 3D multi object detection and tracking method with single LiDAR sensor using KITTI dataset for autonomous driving
- Participated in development of post-processing module that filters the false positive of detected objects by aligning CAD model in the bounding boxes, which is inspired from an implicit characteristic of LiDAR that cannot penetrate an object
- Tracked detected objects and decided the motion state of them by applying Kalman Filter or Deep Learning based tracking algorithm and calibrated the exact location of detected objects by utilizing IMU/GPS sensor data

### Regularization strategy for point cloud with rigidly mixed sample

July.2020-Nov.2020

Yonsei University

Korea

- Regularized deep neural networks for point cloud processing proposing novel data augmentation strategy by generating virtually mixed samples from two point clouds using carefully designed mixup function for point clouds
- Proposed a concept of Rigid Subset, which is extended concept of mask in mixup-based approaches in image domain, to preserve structural information of each point cloud samples intactly when synthesize the two samples
- Outperform existing conventional data augmentation methods in three dimensional computer vision with remarkable performances for shape classification on point cloud

### Surface reconstruction system from the raw point cloud with RGB images

July.2019-Nov.2020

Yonsei University | ETRI(Electronics and Telecommunications Research Institute)

Korea

- Participated in the project that developed the 3D surface reconstruction system from raw point cloud of a place using instance segmentation, camera odometry and CGAL
- Classified extracted raw point cloud data according to class of the objects in the scene by a labeling process based on instance segmentation(Mask RCNN) and camera odometry with paired RGB images
- Constructed the module that reconstructs surfaces of the classified point clouds by applying normal vector estimation and advanced surface reconstruction method of CGAL and developed a tool to integrate generated meshes

## SELECTED PAPERS

- Regularization Strategy for Point Cloud via Rigidly Mixed Sample  
*IEEE/CVF Computer Vision and Pattern Recognition (CVPR), Jun.2021*  
**Dogyoon Lee**, Jaeha Lee, Junhyeop Lee, Hyeongmin Lee, Minhyeok Lee, Sungmin Woo, Sangyoun Lee
- Robust Lane Detection via Expanded Self attention  
*IEEE/CVF Winter Conference on Applications of Computer Vision(WACV), Jan.2022*  
Minhyeok Lee, Junhyeop Lee, **Dogyoon Lee**, Woojin Kim, Sangwon Hwang, Sangyoun Lee
- False Positive Removal For 3D Vehicle Detection with Penetrated Point Classifier  
*IEEE International Conference on Image Processing(ICIP), Oct.2020*  
Sungmin Woo, Sangwon Hwang, Woojin Kim, Junhyeop Lee, **Dogyoon Lee**, Sangyoun Lee
- 3D Mesh Transformation Preprocessing System in the Real Space for Augmented Reality Services  
*ICT Express, Mar.2021*  
Young-Suk Yoon, Sangwon Hwang, **Dogyoon Lee**, Sangyoun Lee, Jae-Won Suh, Sung-Uk Jung

## RESEARCH INTERESTS

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Machine Learning, 2D/3D Computer Vision, Computer Graphics, Image/Point Cloud Processing, Implicit Neural Representation

## LANGUAGE

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Korean(Native), English(Intermediate)

## SKILLS

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**Programming Language:** C, C++, Python, MATLAB

**Deep Learning Framework:** PyTorch, TensorFlow