Minjung Kim

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Research Interests

My research interests are in the field of **3D Place Recognition** and **Visual Localization**, especially about (i) understanding the scene from images and point clouds, (ii) dealing with 2D-3D cross-modalities, and (iii) utilizing high-level semantic information for place recognition.

Education

Seoul National University — Seoul, Korea
Integrated M.S./Ph.D. Student in Computer Science and Engineering; **(GPA: 4.03/4.3)** — *Mar. 2018 – Current*
Vision and Learning lab, advised by Prof. Gunhee Kim.

Sogang University — Seoul, Korea
B.S. in Computer Science and Engineering; **(GPA: 3.58/4.3), Magna Cum Laude** — *Mar. 2014 – Feb. 2018*
Advised by Prof. Hyukjun Lee.

Publications

EP2P-Loc: End-to-End 3D Point to 2D Pixel Localization for Large-Scale Visual Localization — (submitted)
Minjung Kim, Junseo Koo, Gunhee Kim

Indoor/Outdoor Transition Recognition Based on Door Detection — UR 2022
Seohyun Jeon, **Minjung Kim**, Seunghwan Park, Jaeyoung Lee

Drop-Bottleneck: Learning Discrete Compressed Representation for Noise-Robust Exploration — ICLR 2021
Jaekyeom Kim, **Minjung Kim**, Dongyeon Woo, Gunhee Kim

Logo Detection and Recognition Algorithm using YOLO-v3 Model — CICS 2020
Minjung Kim, Sungen Kim, Gunhee Kim

Memorization Precedes Generation: Learning Unsupervised GANs with Memory Networks — ICLR 2018
Youngjin Kim, **Minjung Kim**, Gunhee Kim

Machine Learning for Determining Duplicate Question — KSC 2017
Minjung Kim, Yeongjoon Park, Hyungsuk Lim, Jihoon Yang

Sketch based Face Image Generation with Text Mapping — KSC 2017
Minjung Kim, Hyungsuk Lim, Yeongjoon Park, Yeseul Joo, MyoungWan Koo

Projects

DeepGuider | *GitHub* — *Apr. 2019 – Current*

- DeepGuider Project is a research project funded by national government.
- This project aims to develop a navigation guidance system that enables robots to navigate in urban environment without the need of pre-mapping of the environment.
- I contribute to finding clues to locate autonomous robots by detecting and recognizing points of interests (POIs) in images of a scene.
- This includes detecting and recognizing text including Korean, English and numbers in scenes, recognizing landmarks, recognizing doors for indoor-outdoor transition, and devising training methods that are robust to environmental changes.

PRIDE: 3D Place Recognition In Dynamic Environment | *GitHub* *Mar. 2022 – Current*

- In this work, we first contribute a new dataset named PRIDE (3D Place Recognition In Dynamic Environment), using Lyft Level 5 and KITTI datasets, as a more realistic and challenging benchmark for 3D place recognition.
- We also propose a PRIDE-Net architecture with a new loss that focuses on extracting discriminative global descriptors with capturing global context using spatial information and being robust to such dynamic environments using an auxiliary task to reduce the influence of dynamic objects.
- The code will be released after acceptance.

FCAT: Fully Convolutional Network with Self-Attention for Point Cloud based Place Recognition | *GitHub* *Dec. 2020 – Feb. 2022*

- We construct a novel network named FCAT (Fully Convolutional network with a self-ATtention unit) that can generate a discriminative and context-aware global descriptor for place recognition from the 3D point cloud.
- It features with a novel sparse fully convolutional network architecture with sparse tensors for extracting informative local geometric features computed in a single pass.
- It also involves a self-attention module for 3D point cloud to encode local context information between local descriptors.
- The code will be released after acceptance.

Bayesian Deep Learning course | *Lecture* *Feb. 2018 – Jul. 2018*

- To understand deep learning papers, we explain the basic concepts of probability and Bayesian, and introduce papers related to Bayesian neural networks.
- This lecture can be taken through *edwith* of Naver Connect.

Sketch based Face Image Generation with Text Mapping | *GitHub* *Sep. 2017 – Feb. 2018*

- A typical sketch might have been uncomfortable when a person or program was used to map a person's features in detail.
- This process is limited not only because it is very complex and requires technicians, but also because it creates a feeling of incompatibility with real people.
- This program, named Metamon, makes a picture of a person's face by entering the image of the border sketch of the person's face and the text information that shows the characteristics of the face.

Arduino & Raspberry Pi & Internet of Things (IoT) Tutorial | *Project page* *Dec. 2016 – Mar. 2017*

- I create tutorial pages with Youtube videos and code for beginners in Arduino kit and Raspberry Pi development.
- I introduce the concept of the Internet of Things (IoT) and work on a mini-project using *ThingSpeak*™.

Sogang Navigation and Introduction (SNI) | *Github* *Mar. 2015 – Jul. 2015*

- We develop a navigation system that introduces the internal facilities of each building and displays the shortest route and time from building to building using the Floyd-Washall algorithm.
- To build data for the development, we measured the time taken by walking directly on each path.

EXPERIENCES

2022-3 SK hynix ML Engineer course Seoul National University
Teaching Assistant *Nov. 2022 – Dec. 2022*

KDB-SNU AI course Seoul National University
Teaching Assistant *Apr. 2022 – May. 2022*

LG AI core human resource training course Seoul National University
Teaching Assistant *Feb. 2022*

IoT · Artificial Intelligence · Big Data (IAB) course Seoul National University
Teaching Assistant *Sep. 2018 – Jun. 2019*

Bayesian Deep Learning course Naver Connect
Publisher *Feb. 2018 – Jul. 2018*

Vision and Learning Laboratory — Seoul National University
Research Intern — *Jul. 2017 – Feb. 2018*

Biointelligence Laboratory — Seoul National University
Research Intern — *Sep. 2016 – Feb. 2017*

Arduino & Raspberry Pi Kit Developer — MakeWith (Startup)
Development Intern — *Dec. 2016 – Jan. 2017*

Awards & Scholarships

Animal Datathon Korea — Animal Tech Korea
Predicting joint coordinates of a cow for pose estimation; **2nd place** — *Jul. 2021*

Samsung Humantech Paper Award — Samsung Electronics
Signal Processing section; **Silver prize** — *Feb. 2021*

KSC 2017 Paper Award — Korean Institute of Information Scientists and Engineers
The undergraduate/junior thesis contest award; **Third prize** — *Feb. 2018*

Magna Cum Laude Honor — Sogang University
Academic Honors — *Feb. 2018*

Academic Excellence Scholarship — Sogang University
Academic Honors — *Jul. 2017 – Feb. 2018*

Windows 10 IoT Core & Microsoft Azure for Microsoft IoT Solution Competition — Microsoft
Implementing Internet of Things (IoT) projects with Windows 10 IoT Core and Microsoft Azure; **10th place** — *Apr. 2017*

Skills

Programming: Python, C, C++
Frameworks: Pytorch, TensorFlow/Keras
Tools: Git, VSCode, Vim, Docker, Slurm
Others: Arduino, Rapsberry Pi

Professional Activites

Reviewer of international conferences

- IEEE/CVF International Conference on Computer Vision (ICCV) 2023
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2023
- Asian Conference on Computer Vision (ACCV) 2022
- International Conference on Learning Representations (ICLR) 2022, 2023
- Neural Information Processing Systems (NeurIPS) 2021, 2022, 2023

Technical Coaching

- 2022-3 SK hynix ML Engineer Technical Coaching