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

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*

- The DeepGuider Project is a national government-funded research project focused on developing a navigation guidance system for robots to navigate urban environments without pre-mapping.
- I contribute to finding clues to locate autonomous robots by detecting and recognizing points of interests (POIs) in images of a scene, including text, landmarks, and doors for indoor-outdoor transition, while also developing robust training methods for environmental changes.

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

- This work proposes a new dataset called PRIDE, which includes dynamic objects such as cars and pedestrians, for 3D place recognition in dynamic environments that are more realistic and challenging than current benchmark datasets.
- The proposed PRIDE-Net architecture with a new loss function focuses on extracting discriminative global descriptors and capturing global context using spatial information, while being robust to dynamic environments.

- Experiments on the PRIDE dataset and existing benchmarks show that our proposed method outperforms previous methods and that each proposed module effectively improves performance.
- 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.

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 also 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

KDB-SNU AI course Seoul National University
Teaching Assistant *Apr. 2023*

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 — *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