Sunghwan Kim

Website: sunghwan.me **Email:** ssshwan.korea@gmail.com / ssshwan@add.re.kr **Mobile:** +82-10-4305-1311

Education

University of California, San Diego — San Diego, CA, USA
PhD Student, Electrical and Computer Engineering — Sep 2024-Present

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon South Korea
Bachelor of Science in Electrical Engineering and Mathematics (double major) — Mar 2017-Feb 2021

Korea Science Academy of KAIST — Busan, South Korea
Specialized high school for students talented in math and science — Mar 2014-Feb 2017

Publications

1. **Textual Query-Driven Mask Transformer for Domain Generalized Segmentation** [paper]
   Byeonghyun Pak, Byeongju Woo*, Sunghwan Kim*, Dae-hwan Kim, Hoseong Kim*
   European Conference on Computer Vision (**ECCV**), 2024

2. **Texture Learning Domain Randomization for Domain Generalized Segmentation** [paper]
   Sunghwan Kim, Dae-hwan Kim, Hoseong Kim
   International Conference on Computer Vision (**ICCV**), 2023

3. **Data Gathering Trials for the Development of Military Imaging Systems** [paper]
   Maria Niebla, Duncan L. Hickman, Eunjin Koh, Chanyong Lee, Hoseong Kim, Chaehyoen Lim, Sunghwan Kim
   Proc. SPIE, Electro-Optical and Infrared Systems, 2023

Patent

1. **Method and System for Detecting Target Using Time Series Images**
   Chaehyeon Lim, Sunghwan Kim, Hoseong Kim, Eunjin Koh
   KR Patent, 2023 (1025640380000)

Work Experience

Republic of Korea Army (ROKA) — Jun 2021-Present
First Lieutenant — *Daejeon, Republic of Korea*

- Selected as one of the 20 officers in Korea dedicated to science and technology research for national defense.
- Assigned to ADD, the South Korean counterpart to the U.S. DARPA, for the development of defense technology.
- Mentored a number of junior officers and advised them on their research projects on machine learning.

Agency for Defense Development (ADD) — Jun 2021-Present
Machine Learning Engineer — *Daejeon, Republic of Korea*

- **Object detection in infrared imagery**: Designed real-time object detection models for UAVs. Generated synthetic infrared images using a 3D engine for training data and established an end-to-end training pipeline.
- **Model acceleration on edge devices**: Implemented model compression techniques such as feature distillation and structural pruning to accelerate ML models on edge devices, including NPU, FPGA board, and edge GPU.
- **ML-integrated software for UAVs**: Developed multi-threading C++ software that optimizes CPU and NPU resources during the inference phase of ML models, interfacing with the flight control system of UAVs.
- **UAVs Flight Tests**: Conducted various 3D simulations that emulate actual operation environments, along with real-world flight tests of UAVs, to verify the stability of ML models for deployment.

Bluepoint Partners — Aug 2020-Mar 2021
Research Assistant — *Seoul, Republic of Korea*

- Bluepoint Partners is an early-stage venture capital firm that invests in deep tech sectors, such as AI and robotics.
- Conducted market analysis on ongoing investments and researched overall technological trends.

Intelligent Network Architecture (INA) Lab at KAIST Oct 2018-Apr 2019
Machine Learning Engineer *Daejeon, Republic of Korea*

- Implemented a real-time super-resolution algorithm that combines ML-based super-resolution with traditional video codecs to achieve real-time capability on edge devices.

Neosapience Dec 2017-Feb 2018
Machine Learning Engineer *Seoul, Republic of Korea*

- Neosapience is a Series B startup that operates an AI-powered virtual actor service specializing in ML-based audio and video synthesis technology.
- Constructed an audio and text pair dataset for training Korean text-to-speech models.

Honor

Korea Army Startup Challenge Gold Prize Oct 2021
Korea Student Aid Foundation (KOSAF) Scholarship Mar 2020
Korea National Scholarship of Excellence in Science and Technology Mar 2019-Feb 2021
- Total $ 20,000 (Full-Ride)

National Scholarship for Undergraduate Study Mar 2017-Feb 2019
- Total $ 13,500 (Full-Tuition)

Skills

Programming Languages: Python, C/C++, JavaScript, MATLAB

Frameworks & Tools: Pytorch, Tensorflow, NumPy, OpenCV, Docker, Git