



# DONGWOOK KIM

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Tech blog

donguk071

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## Interest

I am interested in dataset distillation and model training efficiency, focusing on improving data utilization and learning stability in dynamic environments through continual and federated learning. I am also engaged in 3D vision and scene reconstruction, where I explore efficient representations and neural rendering techniques for robust multi-view and point-cloud understanding. Recently, I have been working on lightweight multimodal large language models (MLLMs) that incorporate point cloud understanding, as well as developing intelligent agent systems that integrate visual information with language-based reasoning.

## Education

### UNIST.

Ulsan, S.Korea

#### Graduate School of Artificial Intelligence, AI core

Jan 2024 – Current

- Total GPA 4.2/4.3
- Visual Information Processing Lab (Prof.Jae-Young Sim)

### Qualcomm Institute, UC San Diego.

SanDiego, CA, US

#### Qualcomm Institute AI Development Projects

Jul 2022 – Aug 2022

- International Researcher

### Kwangwoon Univ.

Seoul, S.Korea

#### B.S in Information Convergence, Major in Data Science

Jan 2018 – 2024

- Total GPA 3.98/4.5, Major GPA 4.16/4.5 (Credits taken: 116/133)
- Deep Imaging and Graphics Lab (Prof.Dongjoon Kim)

## Publications

### International

#### [Under Review] ICLR 2026

May 2026

#### Parameterization-Based Dataset Distillation of 3D Point Clouds through Learnable Shape Morphing (1st author)

Dong-Wook Kim, Jae-Young Yim and Jae-Young Sim

#### NeurIPS 2025

Nov 2025

#### Dataset Distillation of 3D Point Clouds via Distribution Matching (1st author, [link](#))

Jae-Young Yim, Dong-Wook Kim and Jae-Young Sim

#### ICIP-W 2025

Sep 2025

#### Class-Aware Coreset Selection for 3D Point Clouds Classification (2nd author)

Jae-Young Yim, Dong-Wook Kim and Jae-Young Sim

### Domestic

#### IPIU 2024

Jun 2024

#### Controllable Classification via Negative-Context-Aware Learning (2nd author, [link](#))

Jae-Young Yim, Dong-Wook Kim and Jae-Young Sim

**IEIE 2024**

Jun 2024

**Enhancing Quality of Gaussian Splatting in Few Shot Condition by Multi-Scale Augmentation** (1st author, [link](#))

Dong-Wook Kim, Jae-Young Yim and Jae-Young Sim

**HCI Academy of Korea 2023**

Feb 2023

**Synthesized training data for a ship 3D surround view learning model based on user evaluations** (1st author, [link](#))

Dongwook Kim, Jonghun Kim, Taemin Jeong and Dongjoon Kim

## Experience

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**Qualcomm Institute, UC San Diego**

San Diego, CA, USA

**AI Development Project Intern**

Jul. 2022 – Aug. 2022

- Developed a user classification model using the KNIME framework.
- Conducted research on preventing abusive behavior by analyzing and classifying user characteristics on Instagram.

**Kwangwoon University, Visual Informatics Lab**

Seoul, South Korea

**Undergraduate Research Assistant**

Jul. 2021 – Feb. 2024

- Conducted research on implicit modeling (NeRF, LiIF) and GAN-based 3D graphics.
- Led multiple projects involving LiDAR super-resolution, depth estimation, and 3D scene reconstruction.

## Projects

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**Generative AI for Multimodal Transportation Analytics (with MSIT)**

Nov. 2025

- Developing an explainable multimodal chatbot for traffic analysis integrating CCTV video, sensor data, and LLM-RAG pipeline
- Building robust vision models for adverse-weather traffic scenes and constructing synthetic datasets via Unreal Engine simulation
- Designing a multimodal traffic knowledge graph and spatio-temporal GNNs for traffic prediction and anomaly detection

**Distortion-Free SVM Generation Project (with Avicus)**

Jun. 2023

- Built a real-time digital twin of a marine environment using Unreal Engine 5, generating synthetic data from virtual LiDAR and RGB sensors.
- Developed deep learning models for sensor data enhancement, including LiDAR super-resolution and image segmentation.
- Integrated a 3D geometry reconstruction pipeline using calibrated sensor data to achieve a distortion-free Surround View Monitoring (SVM) system.

**VR : Anchorage Simulation with Unreal Engine 5**

Dec. 2022

- Built boat navigation/docking simulator using Unreal Engine 5 (C++/Blueprints), Oculus SDK/OpenXR.
- Implemented hand-gesture steering via UE Motion Controller.

**AR : Distortion-Free SVM Generation Project (with Avicus)**

Jun. 2022

- Real-time face capture & avatar rigging with MediaPipe Face Mesh, Three.js/WebGL, blendshape mapping(landmark)
- Optimized animation with inverse kinematics (IK) and temporal smoothing for stable expression control

**ML/DL : Dementia Prediction Project**

Jul. 2022

- Predicted dementia risk using tabular data and wearable signal features via ensemble ML models
- Applied DL-based signal classification and feature engineering for multimodal health data

## **Computer Vision : OpenCV Camera Calibration & Panda3D XR Project**

Current

- Implementing camera calibration, pose estimation, and XR visualization using OpenCV & Panda3D
- Developing real-time calibration pipeline for stereo vision XR systems

## **Competition & Awards**

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### **2nd Prize, 2025 Samsung AI Challenge**

Oct. 2025

- Developed an AI co-researcher agent integrating MCP and RAG architectures.
- Implemented context management using ChromaDB for efficient information retrieval and dialogue grounding.

### **1st Prize, SKT FLY AI Competition**

Feb. 2024

- Developed a motion-synchronized meta character that reacts dynamically to conversation using rigging, retargeting, and TTS.
- Designed and trained an emotion classification network through conversational text data.

### **1st Prize (Minister's Award), AI Contest for Software-Centered Universities**

Oct. 2022

- Competed in an OCR task for signage image recognition.
- Enhanced model performance through advanced data augmentation and ensemble learning strategies.

### **3rd Prize, Student Creative Design Competition**

Jun. 2022

- Developed *Coverist*, an AI-based book cover generation service.
- Led the end-to-end development process, including AI modeling, web backend, and mobile deployment.

## **Technologies**

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**Programming Languages:** Python, C++, JavaScript, Unreal Blueprints

**Deep Learning & Vision:** TensorFlow, PyTorch, OpenCV

**Simulation & Graphics:** Unreal Engine, Three.js, Panda3D