

NAHYEON (EVELYN) KIM

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1 EDUCATION

University of California, Los Angeles (UCLA)	CA, US
Ph.D. in Computer Science, Advisor: Prof. Khalid Jawed and Prof. Wei Wang	2025 - Present
University of California, Los Angeles (UCLA)	CA, US
M.S. in Mechanical Engineering, Advisor: Prof. Khalid Jawed	2023 - 2024
Seoul National University	South Korea
B.S. in Mechanical Engineering and B.B.A. in Entrepreneurship	2018 - 2023

2 RESEARCH EXPERIENCE

Vision-Language-Action (VLA) Model for Autonomous Driving Robots in Farmland	CA, US
<i>Ph.D. Student, Structures-Computer Interaction Lab</i>	2025 - Present
Advisor: Prof. Khalid Jawed and Prof. Wei Wang, UCLA	
<ul style="list-style-type: none">Researching Vision-Language-Action (VLA) models for autonomous agricultural robots capable of navigating farm environments and collecting multimodal data under natural commands.Developing a data acquisition pipeline that integrates 3D reconstruction and spatial reasoning to identify underrepresented regions in the collected dataset, ensuring comprehensive and well-structured dataset coverage.	
Adaptive Image Composition of two Diffusion Models	South Korea
<i>Research Engineer (Full time), CONNECTEVE Inc.</i>	2024 - 2025
Advisor: Prof. Duhyun Ro, Seoul National University	
<ul style="list-style-type: none">Developed a novel framework that integrates and harmonizes the outputs of two DDPM models during the denoising process, enabling realistic and semantically consistent composite image generation.Introduced a resampling mechanism to control object-background interaction, improving contextual adaptability and object-background coherence.	
Self-Supervised Viewpoint Selector for Neural Radiance Fields (NeRF)	CA, US
<i>M.S. Student, Structures-Computer Interaction Lab</i>	2023 - 2024
Advisor: Prof. Khalid Jawed, UCLA	
<ul style="list-style-type: none">Maximized the training efficiency of NeRF models by introducing Self-supervised NeRF Image Selection (SNIS), an unprecedented image selection strategy that identifies optimal camera poses.Proposed a novel pseudo-label, analogous to a reinforcement learning reward function, enabling the application of a self-supervised learning framework into NeRF model trainingIntegrated NeRF training with Unity environment-operated cameras, introducing an innovative research methodology to advance NeRF studies.	
Visual Positioning System (VPS) with Machine Learning	South Korea
<i>Research Engineer (Full time), VR Crew Inc.</i>	2023
<ul style="list-style-type: none">Implemented a VPS algorithm for a VR game, estimating user location via mobile device.VPS system includes LiDAR, point cloud analysis, computer vision feature analysis with deep learning, epipolar geometry, homography adaptation.Led research focused on Keypoint Extractor, PnP, PnL, Point Matching, and Global Descriptor.	
Knowledge Distillation with Network Inversion, Domain Adaptation	South Korea
<i>Research Internship, Korea Institute of Science and Technology (KIST)</i>	2021 - 2022
Advisor: Prof. Suhyun Kim, KIST Data Science Team	
<ul style="list-style-type: none">Proposed a novel performance restoration method for pruned networks via optimized knowledge distillation loss with synthetic dataset generated by network inversion.Discovered an upper performance limit during training of the pruned network using synthetic data, indicating the current one-hot label format of the network inversion dataset is incorrect, and proposed an alternative vector-form label.Observed domain shrinkage increases performance during pruning and studied domain adaptation to obtain optimal sub-network focusing on the Batch-Normalization layer.	

Optical Character Recognition (OCR)

Research Internship, Saige Research Inc.

South Korea

2021

Advisor: Prof. Frank Park, Seoul National University

- ◊ Investigated and customized OCR models to automate manufacturing process.
- ◊ The research investigates bilingual models for Korean and English, encompassing document understanding, custom dataset generation, character detection, and recognition.

3 DEVELOPMENT EXPERIENCE

Junior Software Developer, **Datacrunch Global Inc.**

2023

- ◊ Developed Business Decision Solution (BDS), a B2B web service that manages and analyzes large amounts of data in logistics centers, tracking inventory flows in warehouses and evaluating marketing methods based on actual user purchases.
- ◊ Mainly worked on API management using Python, Django, React, and MySQL

Software Development Internship, **PSX Inc.**

2020 - 2021

- ◊ Developed web backend for stock trading platform using Python and Django.
- ◊ Developed the frontend and backend for a prototype of a hybrid application service using React-Native.
- ◊ Established recommendation algorithm for OTT media service that provides content suggestions for users.

4 SELECTED PROJECTS

Comparison Study: Traditional Computer Vision and Deep Learning [[Code](#)]

2021

- ◊ Conducted comparative study examining the performance of deep neural networks when augmented with traditional computer vision algorithms: Warping, SIFT, Edge Detection, and Gabor Filters.
- ◊ Creatively utilized the algorithms to enable the first layer of deep neural networks to comprehend the information.
- ◊ Discovered that computer vision algorithms tend to aid deep neural networks more effectively when operating with higher resolutions compared to lower resolutions.

3D Mouse: Spatial Information Inputs

Seoul National University Creative Design Fair

2021

- ◊ Won 3rd prize at the **10th Creative Engineering Design Fair**.
- ◊ Created a 3D mouse equipped with gyro sensors and ultrasonic sensors, provides spatial input to the computer.
- ◊ Implemented and presented a prototype of interactive spatial mouse control service in 3D visualization of the skeletal structure captured through CT imaging.

Spline Visualization and Scene Rendering [[Code](#)]

2020 - 2021

- ◊ Designed 3D polygonal objects with B-Spline and Catmull-Rom spline.
- ◊ Created dynamic interaction window via mouse and keyboard controls, showcasing implicit surfaces and objects.
- ◊ Depicted the details of objects using various light sources and Phong illumination, and represented them through ray-tracing.

5 PUBLICATIONS & PATENT

[Under Review] **Nahyeon Kim** and Seyun Kim. "DiffusionMix: Adaptive Image Composition through Merging Two DDPM Denoising Processes.", *Pattern Recognition*.

[Under Review] **Nahyeon Kim** and Suhyun Kim. "KDO: Data-Free Retraining of Pruned Networks.", *IEEE Access*.

[Published] **Nahyeon Kim**. "Advancing Neural Radiance Fields through Self-Supervised NeRF Image Selector (SNIS)." *UCLA Electronic Theses and Dissertations*, 2024.

[Issued] Kim, Nahyeon, 2023, Apparatus and method for performing visual localization effectively, Korean Patent No. 10-2023-0054544, filed April 26, 2023, and issued December 18, 2023.

6 SKILLS

Programming Languages

Python, C++, MATLAB, JavaScript, React, React Native

Scientific Libraries

PyTorch, TensorFlow, JAX, Hugging Face Transformers, OpenAI CLIP, Diffusers, PyTorch3D, Open3D, ROS, LangChain, OpenCV, SciPy, Scikit-Learn

Software & Tools

Docker, Singularity, Git, MySQL, Linux, L^AT_EX, Blender, HTML/CSS

Optimization & Math

Convex/Nonlinear Optimization, Numerical Methods, Probabilistic Modeling, Bayesian Inference, Control