

Younggun Kim

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RESEARCH INTEREST

- 1) Human Intention Understanding based on Computer Vision and Large Language Models
- 2) AI for Human-Centric Transportation and Mobility Systems
- 3) Multimodal Perception for Autonomous Driving

EDUCATION

University of Central Florida, Florida, U.S.

Aug. 2024 - Dec. 2025

- ✓ Master of Science in Civil Engineering, Smart City Track
- ✓ Advisor: Dr. Mohamed Abdel-Aty
- ✓ Current GPA: **4.0/4.0**

Ajou University, Suwon, South Korea

Mar. 2018 - Feb. 2024

- ✓ Bachelor of Science in Mechanical Engineering
- ✓ Cumulative GPA: **4.28/4.5 (2/95)**

PUBLICATIONS (* mark indicates corresponding authors.)

Accepted Publications

- [1] VRU-Accident: A Vision-Language Benchmark for Video Question Answering and Dense Captioning for Accident Scene Understanding
 - ✓ **Younggun Kim**, Ahmed Abdelrahman*, and Mohamed Abdel-Aty
 - ✓ *International Conference on Computer Vision Workshop (ICCVW)*, 2025.
- [2] Pedestrian Crossing Direction Prediction at Intersections for Pedestrian Safety
 - ✓ **Younggun Kim***, Mohamed Abdel-Aty, Keechoo Choi, Zubayer Islam, Dongdong Wang, and Shaoyan Zhai
 - ✓ *IEEE Open Journal of Intelligent Transportation Systems*, 2025. [Impact Factor: 5.3, JCR Quartiles: Q1]
- [3] 3D Adaptive Structural Convolution Network for Domain-Invariant Point Cloud Recognition
 - ✓ **Younggun Kim** and Soomok Lee*
 - ✓ *Asian Conference on Computer Vision (ACCV)*, 2024.

Under Review & arXiv Preprint

- [1] Safe-LLaVA: A Privacy-Preserving Vision-Language Dataset and Benchmark for Biometric Safety
 - ✓ **Younggun Kim**, Swetha Sirnam, Fazil Kagdi, and Mubarak Shah
 - ✓ Under review at *Conference on Neural Information Processing Systems (NeurIPS)*.
- [2] Multi-view Structural Convolution Network for Domain-Invariant Point Cloud Recognition of Autonomous Vehicles
 - ✓ **Younggun Kim**, Beomsik Cho, Seonghoon Rhoo, and Soomok Lee*
 - ✓ Under review at *Expert Systems with Applications*. [Impact Factor: 7.5, JCR Quartiles: Q1]
- [3] Region-Level Vision-Language Model for Detecting Distraction Behaviors and Mobility Attributes of Vulnerable Road Users
 - ✓ Dai Quoc Tran*, Mohamed Abdel-Aty, **Younggun Kim**, Ahmed Abdelrahman, and Zubayer Islam
 - ✓ Under review at *IEEE Transactions on Intelligent Transportation Systems*. [Impact Factor: 8.4, JCR Quartiles: Q1]
- [4] MMCAformer: Macro-Micro Cross-Attention Transformer for Traffic Speed Prediction with Microscopic Connected Vehicle Driving Behaviors
 - ✓ Lei Han*, Mohamed Abdel-Aty, **Younggun Kim**, Yang-Jun Joo, and Zubayer Islam
 - ✓ Under review at *Transportation Research Part C*. [Impact Factor: 7.9, JCR Quartiles: Q1]
- [5] Gated Kinematic-Visual Fusion for Right-Turn Pedestrian Conflict Risk Assessment
 - ✓ Dai Quoc Tran*, Mohamed Abdel-Aty, Qianqian Jin, **Younggun Kim**, and Zubayer Islam
 - ✓ Under review at *Transportation Research Part C*. [Impact Factor: 7.9, JCR Quartiles: Q1]

PROFESSIONAL SERVICES

[1] **Reviewer**, *International Conference on Computer Vision Workshop (ICCVW)*, 2025.

CONFERENCE PRESENTATION

[1] **Younggun Kim** and Soomok Lee* "3D Adaptive Structural Convolution Network for Domain-Invariant Point Cloud Recognition", *the Asian Conference on Computer Vision (ACCV)*, 2024. **[BK21(Brain Korea) Distinguished Conference Paper List]**

Dec. 2024

[2] **Younggun Kim**, Yooseong Lee, Uikyum Kim*, "Design of capable of Grasping and Manipulating Various objects", Oral session presented at the *17th Korean Robotics Society Annual Conference (KROS)*, 2022. **[Best Paper Award]**

May. 2022

PATENTS

Intelligent cradle for a device (Patent No. 10-2506732, KR), First Inventor

Mar. 2023

AWARDS AND SCHOLARSHIPS

UCF Research Assistantship

Fully funded by the University of Central Florida, covering tuition, insurance, and stipend.
Role on the project: Researcher

Aug. 2024 - Dec. 2025

Dean's List: **4 times**

Ajou University, South Korea

Awarded to students ranked in the top 5% of the department based on semester GPA.

Jul. 2021 - Aug. 2023

University Scholarship: **7 times**

Ajou University, South Korea

Sep. 2021 - Sep. 2023

City Scholarship

Asan-si Future Scholarship Foundation, Asan-si, South Korea

Awarded to students who are expected to lead the 4th Industrial Revolution in the future

Jun. 2023

1st Place in the Patent Competition

Ajou University, South Korea

Jun. 2023

Encouragement prize in Academic Club Competition

Ajou University, South Korea

May. 2023

University Scholarship (**1 out of 637**)

Daewoo Scholarship Foundation, Ajou University, South Korea

Awarded to a student ranked 1st in the College of Engineering based on semester GPA.

Apr. 2023

Encouragement prize in Academic Club Competition

Ajou University, South Korea

Jun. 2022

Best Paper Award

Oral session, 17th Korean Robotics Society Annual Conference (KROS), South Korea

May. 2022

1st Place in College of Engineering Academic Club Competition

Ajou University, South Korea

Sep. 2018

TECHNICAL SKILLS

[1] **Specialties:** Deep Learning, Computer Vision, Large Language Models, Dataset and Benchmark Curation

[2] **Languages:** Python, C/C++, Matlab

[2] **Framework:** Pytorch, OpenCV, HF Transformers

[3] **OS:** Linux, Windows

[4] **Analysis:** Ansys workbench

[5] **Manufacturing:** 3D printing

[6] **CAD:** Solidworks

RESEARCH EXPERIENCE (EMPLOYMENT)

Graduate Research Assistant

Aug. 2024 - Dec. 2025

Smart & Safe Transportation Laboratory, University of Central Florida, USA

(Advisor: Prof. Mohamed Abdel-Aty, Board of Trustees Chair Professor, Pegasus Professor,
Email: m.aty@ucf.edu)

- VRU-Accident: A Vision-Language Benchmark for Video Question Answering and Dense Captioning for Accident Scene Understanding
- Proposal of a large-scale benchmark comprising 1K VRU-related crash videos, 6K VQA questions with 24K candidate options, and 1K dense scene-level captions.
- Proposal of a semi-automatic benchmark curation pipeline to effectively generate VQA and Caption.
- ✓ **Accepted at International Conference on Computer Vision Workshop (ICCVW).**
- Pedestrian Crossing Direction Prediction at Intersections for Pedestrian Safety
- A novel transformer-based framework to predict future human crossing direction from CCTV.
- Proposal for Geometric-Invariant Space Embedding System to ensure pedestrian size-invariance, intersection geometric-invariance, and CCTV location-invariance.
- ✓ **Accepted at IEEE Open Journal of Intelligent Transportation Systems.**

Undergraduate Research Assistant

Nov. 2023 - Jul. 2024

Machine Learning & Mobility Laboratory, Ajou University, South Korea

(Advisor: Prof. Soomok Lee, Email: soomoklee@ajou.ac.kr)

- Multi-view Structural Convolution Network for Domain-Invariant Point Cloud Recognition of Autonomous Vehicles
- A new deep learning model, which is developed from ASCN, for domain-invariant PCD recognition
- 2D image-based domain generalization framework modification to adapt it to point clouds
- Proposal for a synthetic point cloud dataset from MORIA simulator
- ✓ **Under review at Expert Systems with Applications (ESWA).**
- 3D Adaptive Structural Convolution Network for Domain-Invariant Point Cloud Recognition
- A novel deep learning network proposal for domain-invariant point cloud recognition
- Adaptive neighborhood sampling method proposal based on principal component analysis
- Experiments about intra-domain and cross-domain environments
- ✓ **Accepted at Asian Conference on Computer Vision (ACCV).**

Undergraduate Research Assistant

Sep. 2021 - Jul. 2022

Interactive & Intelligent Robotics Laboratory, Ajou University, South Korea

(Advisor: Prof. Uikyum Kim, Email: ukim@ajou.ac.kr)

- Design of a soft gripper capable of Grasping and Manipulating Various Objects
- Structure Analysis of the soft gripper through Finite Element Method
- Manipulating force optimization using Ansys
- ✓ **Accomplished Best Paper Award at Korean Robotics Society (KROS).**

ADDITIONAL EXPERIENCE

Coursework Project (Advanced Computer Vision, Advisor: Prof. Mubarak Shah)

Jan. 2025 - May. 2025

- Safe-LLaVA: Privacy-Preserving Vision-Language Dataset and Benchmark for Biometric Safety
- Proposal for captioning and instruction fine-tuning dataset to protect biometric leakage from VLM.
- Proposal for benchmark to thoroughly evaluate leakages of biometric information from VLMs.
- ✓ **Under review at Conference on Neural Information Processing Systems. (NeurIPS)**

Robot Project Experience

Mar. 2021 – Feb. 2024

Robot Academic Club in Ajou University

- President of the robot academic club from Mar.2021 to Feb.2022
- Intelligent cradle for a device
 - User heading angle and position recognition system design based on key point recognition
 - System control from information about user heading angle and position
- ✓ **Registered South Korea patent as first inventor**
- Design of a robotic gripper based on under-actuated mechanism to grasp the various objects
 - Kinematic model Analysis of robotic gripper to grasp various object
 - Gripper motion simulation using Matlab
 - Gripper's real-time state visualization via OpenGL
- ✓ **Accomplished 1st Place in the Patent Competition**
- Teleoperated Robot Arm
 - Hardware and Software design for teleoperation system
- ✓ **Accomplished Encouragement Prize in academic club competition**
- Biomimicry robot referring to Festo's Smart Bird
 - Robotic bird kinematics analysis and design using CAD tool and 3d printing
- ✓ **Accomplished Encouragement Prize in academic club competition**

Republic of Korea Army

Apr. 2019 - Nov. 2020

- Mandatory military service

Robot Project Experience

Mar. 2018 - Mar. 2019

Robot Academic Club at Ajou University

- Design of Turtle Ship Using Conventional Power Sources
 - A turtle ship design using CAD tool and 3d printing
- ✓ **Accomplished 1st place in College of Engineering academic club competition**

REFERENCE

Dr. Mohamed Abdel-Aty (Email: m.aty@ucf.edu)

- Board of Trustees Chair Professor and Pegasus Professor, University of Central Florida, FL, U.S.
- Citations: 38,500+, H-index: 106
- Emeritus Editor, *Accident Analysis & Prevention*
- Member of the Editorial Advisory Board, *Transportation Research Part C*

Dr. Keechoo Choi (Email: keechoo@ajou.ac.kr)

- President, Ajou University, Suwon, South Korea
- Founding Editor-in-Chief, *International Journal of Sustainable Transportation*

Dr. Soomok Lee (Email: soomoklee@ajou.ac.kr)

- Associate Professor, Department of Mobility Engineering, Ajou University, Sowon, South Korea
- Vice Chair, Department of Mobility Engineering, Ajou University, Suwon, South Korea