Younggun Kim

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RESEARCH INTERESTS

1) **Mobility Systems:** Deep Learning, Computer Vision, Large Language Models, Intelligent Transportation Systems
2) **Urban Mobility Data Analysis:** Multimodal Perception, Pattern Recognition, LiDAR & Camera Fusion, LBS Data Analysis
3) **Sustainable Transportation:** Road User Behavior Modeling, Safety Analytics, Transportation Accessibility

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**
- ✓ *Selected Coursework: Data Mining; Advanced Computer Vision; Machine Learning*

Ajou University, Suwon, South Korea **Mar. 2018 - Feb. 2024**
- ✓ Bachelor of Science in Mechanical Engineering
- ✓ Cumulative GPA: **4.28/4.5 (3.9/4.0) (top 2%)**
- ✓ *Selected Coursework: Data Structures; Convergent Programming; Machine Learning*

PUBLICATIONS (* and † indicate corresponding authors and equal contributions, respectively.)

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 International Conference on Learning Representations (ICLR).

[2] MSCN: Multi-view Structural Convolution Network for Domain-Invariant Point Cloud Recognition of Autonomous Vehicles
- ✓ **Younggun Kim,** Mohamed Abdel-Aty, Beomsik Cho, Seonghoon Rhoo, and Soomok Lee*
- ✓ Under review at *IEEE Robotics and Automation Letters.* [Impact Factor: 5.3, 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 Zybayer 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 Zybayer 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, *IEEE Open Journal of Intelligent Transportation Systems*, 2025.
[2] Reviewer, *Transportation Research Board Annual Meeting*, 2025. (**5 times**)
[3] Reviewer, *Science of Remote Sensing*, 2025.
[4] Reviewer, *IEEE Transactions on Multimedia*, 2025.
[5] Reviewer, *International Conference on Computer Vision Workshop (ICCVW)*, 2025.

CONFERENCE PRESENTATION

[1] **Younggun Kim**, Ahmed Abdelrahman*, and Mohamed Abdel-Aty, "VRU-Accident: A Vision-Language Benchmark for Video Question Answering and Dense Captioning for Accident Scene Understanding", *International Conference on Computer Vision Workshop (ICCVW).* **Oct. 2025**

[2] **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**

[3] **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)*. **[Best Paper Award]** **May. 2022**

PATENTS

Younggun Kim, Minjoung Sim, Hojun Lee, Wonjun Choi, and Hanbin Choi, Intelligent cradle for a device (Patent No. 10-2506732, KR) **Mar. 2023**

AWARDS AND SCHOLARSHIPS

UCF Research Assistantship **Aug. 2024 - Dec. 2025**
Fully funded by the University of Central Florida, covering tuition, insurance, and stipend.

Dean's List: 4 times **Jul. 2021 - Aug. 2023**
Ajou University, South Korea
Awarded to students ranked in the top 5% of the department based on semester GPA.

University Scholarship: 7 times **Sep. 2021 - Sep. 2023**
Ajou University, South Korea

Encouragement prize in Academic Club Competition: 2 times **Jun. 2022, May. 2023**
Ajou University, South Korea

City Scholarship **Jun. 2023**
Asan-si Future Scholarship Foundation, Asan-si, South Korea
Awarded to students who are expected to lead the 4th Industrial Revolution in the future

1st Place in the Patent Competition **Jun. 2023**
Ajou University, South Korea

University Scholarship (1 out of 637) **Apr. 2023**
Daewoo Scholarship Foundation, Ajou University, South Korea
Awarded to a student ranked 1st in the College of Engineering based on semester GPA.

Best Paper Award **May. 2022**
Oral session, 17th Korean Robotics Society Annual Conference (KROS), South Korea

1st Place in College of Engineering Academic Club Competition **Sep. 2018**
Ajou University, South Korea

TECHNICAL SKILLS

[1] Specialties: Deep Learning, Computer Vision, Large Language Models, Dataset and Benchmark Curation
[2] Programming: Python, C/C++, Matlab **[2] Framework:** Pytorch, OpenCV, HF Transformers **[3] OS:** Linux, Windows
[4] Analysis: Ansys Workbench **[5] Manufacturing:** 3D printing, Laser cutting **[6] CAD:** SolidWorks

RESEARCH EXPERIENCES (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 Cap tioning 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*)*

- 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).***

- 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 *IEEE Robotics and Automation Letters.***

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 EXPERIENCES

Coursework Project (Advanced Computer Vision, *Advisor: Prof. Mubarak Shah*) **Jan. 2025 - Aug. 2025**

- Safe-LLaVA: Privacy-Preserving Vision-Language Dataset and Benchmark for Biometric Safe ty
- Originally developed as a coursework project (Jan. 2025 to May. 2025).
- Proposal for captioning and instruction fine-tuning dataset to protect biometric leakage from VLM.
- Proposal for a benchmark to thoroughly evaluate leakages of biometric information from VLMs.
- ✓ **Under review at International Conference on Learning Representations (ICLR).**

Project Experience **Mar. 2021 – Feb. 2024**

Academic Club in Ajou University

- President of the 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 the first inventor**

- Design of a robotic gripper based on an under-actuated mechanism to grasp various objects
- Kinematic model Analysis of a robotic gripper to grasp various objects
- Gripper motion simulation using Matlab and SolidWorks
- Gripper's real-time state visualization via OpenGL
- ✓ **Accomplished 1st Place in the Patent Competition**

Republic of Korea Army **Apr. 2019 - Nov. 2020**

- Mandatory military service

Project Experience **Mar. 2018 - Mar. 2019**

Academic Club at Ajou University

- Design of Turtle Ship Using Conventional Power Sources
- A turtle ship design using SolidWorks
- ✓ **Accomplished 1st place in College of Engineering academic club competition**