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**
- ✓ *Selected Coursework: Algorithms & Models for Smart Cities; CAVs; Advanced Computer Vision*

Ajou University, Suwon, South Korea   Mar. 2018 - Feb. 2024
- ✓ Bachelor of Science in Mechanical Engineering
- ✓ Cumulative GPA: **4.28/4.5 (2/95)**
- ✓ *Selected Coursework: Data Structures; Numerical Analysis and Machine Learning*

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 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**, *International Conference on Computer Vision Workshop (ICCVW)*, 2025.

CONFERENCE PRESENTATION

[1] <u>**Younggun Kim**</u> 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] <u>**Younggun Kim**</u>, 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. **[<u>Best Paper Award</u>]**   **May. 2022**

PATENTS

Intelligent cradle for a device (Patent No. 10-2506732, KR), First Inventor   **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.
Role on the project: Researcher

Dean's List: <u>4 times</u>   **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: <u>7 times</u>   **Sep. 2021 - Sep. 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

Encouragement prize in Academic Club Competition   **May. 2023**
Ajou University, South Korea

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

Encouragement prize in Academic Club Competition   **Jun. 2022**
Ajou University, South Korea

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] **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