Seokjun Kwon

M.S Student · Sejong University

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About Me

I am an **AI Robotics Engineer** who researches and develops **perception and planning technologies for the autonomous mobility** of robots and autonomous vehicles.

Research Interests

- **Embodied AI**: Robust Scene Perception & Navigation in Robotics, Self-Driving
- **Physical AI**: Vision-Language-Action (VLA) for Mobile Robots
- **Robustness**: Domain Adaptation/Generalization for Real-World Deployment

Education

Sejong University *Seoul, South Korea*

M.S in Department of AI Robotics *Mar.2024 - Aug.2026*

- Advisor: Prof. Yukyung Choi

Sejong University *Seoul, South Korea*

B.S in Department of Intelligent Mechatronics Engineering *Mar.2018 - Feb.2024*

- Hornors: Cum Laude (Overall GPA: 3.94/4.5, Major GPA: 4.24/4.5)
- Undergrad advisor: Prof. Yukyung Choi

Work

NAVER LABS Corp. *Seongnam, South Korea*

Robot Vision & Learning Team Intern *Apr.2025 - Sep.2025*

- Advisor: Sunwook Choi

Publications

[P1] DensePR: Dense 3D Geometry-aware Visual Place Recognition *TBU*

Seokjun Kwon, Jungwoo Kim, Yukyung Choi, and Sunwook Choi

- Under Review

[J3] Multi-Modal Guided Multi-Source Domain Adaptation for Object Detection *Jun, 2026*

Sangin Lee*,**Seokjun Kwon***, Jeongmin Shin, Namil Kim, and Yukyung Choi

- **Knowledge-Based Systems**
- Impact Factor: 7.6 **(SCIE, Q1)**
- * Co-first author

[J2] ContraText-DETR: Boosting Industrial Scene Text Detection Based on Contrastive Learning and Synthetic Low-Contrast Text *Jul, 2025*

Yunseo Jeong ,**Seokjun Kwon**, Jeongmin Shin, and Yukyung Choi

- IEEE Sensors Journal
- Impact Factor: 4.5 **(SCIE, Q1)**

[C3] Boosting Cross-spectral Unsupervised Domain Adaptation for Thermal Semantic Segmentation *May, 2025*

Seokjun Kwon*, Jeongmin Shin*, Namil Kim, Soonmin Hwang, and Yukyung Choi

- International Conference on Robotics and Automation **(ICRA)**
- Acceptance Rate: 38.7%

[C2] A Two-Stage Framework for Small Character Detection in the Manufacturing Industry *Nov, 2024*

Yunseo Jeong*, **Seokjun Kwon***, Jeongmin Shin and Yukyung Choi

- International Conference on Control, Automation and Systems (ICCAS)

[J1] UMHE: Unsupervised Multispectral Homography Estimation *Apr, 2024*

Jeongmin Shin, Jiwon Kim, **Seokjun Kwon**, Namil Kim, Soonmin Hwang, and Yukyung Choi

- IEEE Sensors Journal
- Impact Factor: 4.3 **(SCIE, Q1)**

[C1] Unsupervised Domain Adaptation with Mutual Learning for Semantic Segmentation for Thermal Images *Feb, 2023*

Seokjun Kwon, Jeongmin Shin, Daechan Han, and Yukyung Choi

- Image Processing and Image Understanding (IPIU)
- Bronze Prize, **Best Paper Award**

Engineering Projects

Construction of a Mobile Manipulator System for Mail Delivery *Sejong Univ*

Mobile Manipulator *Mar. 2026 - Current*

- **Manipulation**: Grasping, handling, and loading mail using the SO-ARM101.
- **Destination OCR**: Recognizing room numbers to sort mail into slots.
- **Autonomous Delivery**: Destination navigation via visual navigation, followed by mail pick-and-place.

Development of NPU-portable AI Model for Machine Vision Cameras *Sejong Univ*

NPU, # Tiny Object Detection *Sep. 2023 - Dec. 2024*

- Detected micro-parts (12 pixels) in high-resolution (2560×2048) images.
- Model **lightweighting** & **ONNX porting** for machine vision **NPU** system.

Environmental Cleaning Robot Detection System with ROS 2 *Sejong Univ*

Embedded Board, # Object Detection *Mar. 2023 - Jun. 2023*

- Established **webcam-Jetson Nano** communication via **ROS 2 (Foxy)**.
- Model fine-tuning & **porting** for real-time inference on the **embedded board**.

Construction of RGB-Thermal Multispectral Dataset *Sejong Univ*

Sensor Pack, # Sensor Calibration *Jul. 2022 - Mar. 2023*

- Sensor pack setup, **time synchronization** and **calibration**.
- Designed data collection scenarios and records.
- Performed **RGB-Thermal image warping** post-acquisition.

Research Projects

Research on Autonomous eVTOL Core Convergence Technology for Urban Air Mobility (UAM). *Sejong Univ*

Funded by The Ministry of Science and ICT (MSIT) *Jul. 2024 - Current*

- Developed an open-vocabulary object detection algorithm for autonomous eVTOL driving and landing.

ICT Challenge and Advanced Network of HRD *Sejong Univ*

Funded by The Ministry of Science and ICT (MSIT) *Jul. 2022 - Current*

- Developed a model for estimating the homography matrix between RGB and Thermal Images. **[J1]**

Development of an AI-Based High Resolution Low Power Smart Camera and Machine Vision Integrated Solution for Defect Detection in Manufacturing *Sejong Univ*

Funded by Ministry of Trade, Industry and Energy (MOTIE) *Apr. 2023 - Dec. 2025*

- Developed a real-time small character detection algorithm for machine vision camera. **[C2]**

Development of AI Camera Technology to Support Battlefield Environmental Awareness and Weapon System Performance *Sejong Univ*

Funded by The Ministry of Science and ICT (MSIT) *Mar. 2022 - Jan. 2023*

- Developed a domain adaptation algorithm for a thermal sensor-based semantic segmentation task. **[C3, C1]**

Awards

MSIT 1st Autonomous Driving AI Challenge *Nov, 2024*

- **3rd Prize**
- Developed object detection and instance segmentation algorithms for autonomous driving car.

The 35th Workshop on Image Processing and Image Understanding (IPIU) *Feb, 2023*

- Bronze Prize, **Best Paper Award**

Sejong AI Challenge *Nov, 2022*

- **3rd Prize**
- Python Track

Patents

Method and apparatus for text detection in industrial environments using a deep learning model *May, 2025*

- Korea patent (applied) No. 10-2025-0069631

Multi-source domain learning method and apparatus for object detection *May, 2025*

- Korea patent (applied) No. 10-2025-0064651

Multispectral Homography Estimation Method and Apparatus *Jan, 2025*

- Korea patent (registered) No. 10-751399

Method for Detecting Defects in Manufacturing Industrial Products and Apparatus *Sep, 2024*

- Korea patent (applied) No. 10-2024-0118908

Cross Spectral Unsupervised Domain Adaptation Method and Apparatus *Aug, 2024*

- Korea patent (applied) No. 10-2024-0113714

Teaching Experience

Artificial Intelligence *Fall, 2025*

Instructor: Prof. Yukyung Choi

- Role: Teaching Assistant

Deep Learning System *Spring, 2024*

Instructor: Prof. Yukyung Choi

- Role: Head Teaching Assistant

Artificial Intelligence *Fall, 2023*

Instructor: Prof. Yukyung Choi

- Role: Teaching Assistant

Machine Learning *Spring, 2023*

Instructor: Prof. Yukyung Choi

- Role: Teaching Assistant

Skills

Tech	**Python, PyTorch, C/C++, MATLAB, OpenCV, ROS2, HuggingFace, Linux, Git, Docker, Conda**,
Languages	**English**, (OPIc IM2)