MINSIK JEON

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RESEARCH INTEREST

- **Robotics**
  Robotic Perception, Uncertainty-aware Perception & Navigation, Active Perception
- **Computer Vision**
  Domain Adaptation, Self-supervised Learning, Sensor Fusion, Open-World Perception

EDUCATION

- **Korea Advanced Institute of Science and Technology (KAIST)** — Daejeon, Korea
  Bachelor of Science in Computer Science — *Mar. 2018 – Feb. 2022*
  Bachelor of Science in Electrical Engineering
  GPA: 4.01/4.30 (Total 157 Credits); Major: 4.02/4.30 ; Upper Division: 4.12/4.30
  Dean's List 3 semesters; ***Summa Cum Laude***
- **Gyeonggi Science High School for Gifted Students** — Suwon, Korea
  High school for talented students in math and science — *Mar. 2015 – Feb. 2018*

PUBLICATIONS

* indicates equal contribution.

1. **Open-World Object Detection with Instance Representation Learning**
   Sunoh Lee, Minsik Jeon*, Jihong Min, Junwon Seo.*
   Submitted to IEEE International Conference on Robotics and Automation (**ICRA**), 2025. [link]
   Accepted to **IROS Workshop** on Label Efficient Learning Paradigms for Autonomy at Scale, 2024
2. **DA-RAW: Domain Adaptive Object Detection for Real-World Adverse Weather Conditions**
   Minsik Jeon, Junwon Seo*, Jihong Min.*
   IEEE International Conference on Robotics and Automation (**ICRA**), 2024. [link] [project page]

RESEARCH EXPERIENCE

- **Agency for Defense Development - Defense AI Center** — Daejeon, Korea
  Research Officer for National Defense — *Jun. 2022 – Present*
  - **Project: Multi-robot Cooperative Autonomous Driving**
    – Develop a BEV traversability map by combining traversability estimates from multiple UGVs and UAVs for off-road autonomous driving, including sensor data integration, UAV image registration, and uncertainty-aware mapping.
    – Build a generalizable LiDAR semantic segmentation model across various LiDAR sensor configurations.
  - **Project: Deformable Object Recognition Technology**
    – Researched an open-world object detection and instance representation learning method using foundation models, enhancing the reliability and adaptability of detectors in off-road environments with unknown objects.
    – Devised an unsupervised domain adaptation method to improve robustness of detector in real-world adverse weather.
  - **Project: Adaptive Path Planning Based on Situational Awareness and Dynamic Model Learning**
    – Designed a perception system with multi-sensor fusion for robust off-road autonomous driving, integrating LiDAR and cameras for semantic terrain classification, mapping, and dynamic object detection and tracking.
    – Examined path planning and control algorithms for high-speed navigation in complex environments.
  - **Project: Unmanned Reconnaissance Vehicles Development**
    – Implemented a real-time LiDAR and Infrared camera fusion method for robust object detection, enabling reliable vehicle operation in visibility-constrained scenarios.

◦ **Neuro-Instrumentation and Computational Analysis Lab, KAIST** Daejeon, Korea
Undergraduate Researcher, advised by Prof. Young-Gyu Yoon *Oct. 2021 – Feb. 2022*

- **Project: Microscopy Image Artifact Removal and Super-Resolution**
  – Built a super-resolution network for light sheet microscopy images using a 3D style transfer model and confocal microscopy data, improving the quality of 3D microscopy images by removing line artifacts.

◦ **Unmanned System Research Group, KAIST** Daejeon, Korea
Undergraduate Researcher, advised by Prof. David Hyunchul Shim *Jun. 2021 – Sep. 2021*

- **Project: Indy Autonomous Challenge (IAC)**
  – Developed the detection and tracking algorithm and the overtaking policy for the Indy Autonomous Challenge (IAC), the first autonomous car racing competition, as an intern of Team KAIST ***(Achieved 4th place)***.

Work Experience

◦ **Research Officer for National Defense** Daejeon, Korea
First Lieutenant, Republic of Korea Army *Apr. 2022 – Present*

- Selected as one of the 20 officers in the nation dedicated to science and technology research for national defense.
- Organized weekly machine learning and computer vision seminars, exploring their applications to current projects.

◦ **SK Hynix** Seongnam, Korea
Winter Intern *Dec. 2019 – Feb. 2020*

- **Project: Performance and Operation Analysis of On-board RAID**
  – Analyzed the performance and operations of each On-board RAID option ***(Selected as Best Intern Project)***.

Domestic Conferences

1. *M. Jeon, et al*. "Temporally Consistent LiDAR Feature Map Generation using a Foundation Model." Korea Institute of Military Science and Technology (KIMST), 2024.
2. *M. Jeon, et al*. "Open Set Object Detection with Pseudo Labels Obtained via SAM." Korea Institute of Military Science and Technology (KIMST), 2024.
3. *M. Jeon, O. Kim, J. Min*. "Off-road BEV Semantic Map Generation Using a Foundation Model for Autonomous Driving." Korea Institute of Military Science and Technology (KIMST), 2024.
4. *M. Jeon, B. Lee, S. Jang*. "Integrating Reflectivity Images to Enhance LiDAR-Based 3D Object Detection." Korea Robotics Society Annual Conference (KRoC), 2024.
5. *H. Ham, M. Jeon, S. Jang*. "Unsupervised Learning with Pseudo-Labels for Object Detection in LiDAR Pointcloud." Korea Institute of Military Science and Technology (KIMST), 2023.
6. *J. Seo, M. Jeon, S. Lee, O. Kim, J. Min*. "2D Object Detection Under Adverse Lighting Conditions Using Near Infrared Images from 3D LiDAR." Korea Institute of Military Science and Technology (KIMST), 2023.
7. *M. Jeon, J. Seo, S. Lee, J. Lee*. "Self-Supervised Traversability Data Generation for Traversability Estimation on Images." Korea Robotics Society Annual Conference (KRoC), 2023.
8. *O. Kim, M. Jeon, S. Shim, J. Seo*. "Traversability Estimation on Unstructured Environments Using IR and RGB Fusion." Korea Robotics Society Annual Conference (KRoC), 2023.
9. *M. Jeon, C. Park*. "Performance and Operation Analysis of On-Board RAID." Korea Institute of Information Scientists and Engineers (KIISE), 2020.

Teaching Experience

◦ **Tutor**, Calculus, KAIST *Mar. 2021 – Dec. 2021*

◦ **Major-specific Mentoring** on Computer Science, Young Engineers Honor Society (YEHS) *Jan. 2021 – Mar. 2022*

SCHOLARSHIPS

- **National Excellence Scholarship for Science and Engineering**, Korea Student Aid Foundation *Mar. 2020 – Feb. 2022*
- **SK Hynix Scholarship for Excellence**, SK Hynix *Mar. 2020 – Feb. 2021*
- **National Scholarship for Undergraduate Study**, Korea Student Aid Foundation *Mar. 2018 – Feb. 2020*

EXTRACURRICULAR ACTIVITIES

- **32th Class of Professional Officer** *2022 – 2025*
  Military Service, First Lieutenant, Republic of Korea Army
- **Young Engineers Honor Society (YEHS)** *2021 – Present*
  Association of Korean engineering students under the National Academy of Engineering of Korea
- **Nanyang Technological University Summer Exchange Student** *2019*
  Short-term (6 weeks) exchange student at Nanyang Technological University (NTU)
- **KAIST Freshman Student Council** *2018 – 2019*
  Student Council for Freshmen at KAIST

SKILLS

- **Programming Languages:** Python, C, C++, MATLAB
- **Technologies:** PyTorch, ROS2, ROS1, Docker, Linux, GIT, OpenCV
- **Languages:** Korean (Native), English (Fluent, TOEFL iBT 105, GRE 153/170/4.0)

REFERENCES

- **David Hyunchul Shim, Professor**
  Department of Electrical Engineering, Korea Advanced Institute of Science and Technology
  (+82) 42-350-7445, hcshim@kaist.ac.kr
- **Young-Gyu Yoon, Associate Professor**
  Department of Electrical Engineering, Korea Advanced Institute of Science and Technology
  (+82) 42-350-7449, ygyoon@kaist.ac.kr
- **Jihong Min, Principal Researcher and Department Leader**
  Defense AI Center, Agency for Defense Development
  (+82) 10-7399-9713, happymin@add.re.kr