

1 Gwanak-ro
Gwanak-gu
Seoul, S. Korea

<https://donkeymouse.github.io/>
donkeymouse@snu.ac.kr
+82 (10) · 5395 · 1831
[Google Scholar](#)

Dong-Guw (David) Lee

FIELD OF INTEREST

Keywords: Thermal infrared Cameras, Robotics, Computer Vision, Vision-Language Model (VLM)

EDUCATION

Seoul National University (SNU) *Aug. 2026*

Ph.D. in Mechanical Engineering

Dissertation: “Data Scaling and Radiometric Representation Learning for Deep Thermal Perception”

Advised by Dr. Ayoung Kim

Korea Advanced Institute of Science Technology (KAIST) *Feb. 2022*

M.S. in Robotics Program

Dissertation: “Thermal image-based Baby and Adult detection robust to residual thermal heat marks”

Advised by Dr. Dong-Soo Kwon

University of Bristol, *Jun. 2019*

BEng. Electrical and Electronic Engineering

Graduated with *First Class Honours (Summa cum laude)*

Dissertation: “An alternative Contact Sensing methods for CNC machines”

Advised by Dr. John Haine

PUBLICATIONS

International Journal

1. Dong-Guw Lee, Jeongyun Kim, Younggun Cho, and Ayoung Kim. Thermal chameleon: Task-adaptive tone-mapping for radiometric thermal-infrared images. *IEEE Robotics and Automation Letters (RA-L)*, 2024
2. Dong-Guw Lee, Hyeonjae Gil, Seungsang Yun, Jeongyun Kim, and Ayoung Kim. Night-to-day thermal image translation for deep thermal place recognition. *Intelligent Service Robotics*, 16(4):403–413, 2023
3. Kyu-Seob Song, Jong Gwan Lim, Dong-Guw Lee, and Dong-Soo Kwon. Motion similarity-based safety hook fastening state recognition via deep siamese neural networks. *IEEE Sensors Letters*, 7(10):1–4, 2023
4. Kyu-Seob Song, Sangseung Kang, Dong-Guw Lee, Young-Hoon Nho, Ji-Seok Seo, and Dong-Soo Kwon. A motion similarity measurement method of two mobile devices for safety hook fastening state recognition. *IEEE Access*, 10:8804–8815, 2022

International Conference Proceedings

1. Dong-Guw Lee, Tai Hyoung Rhee, Hyunsoo Jang, Young sik Shin, Ukcheol Shin, and Ayoung Kim. Thera: Thermal-aware visual-language prompting for controllable rgb-to-thermal infrared translation. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2026
2. Tai Hyoung Rhee, Dong guw Lee, and Ayoung Kim. Tidy: Thermal infrared image denoising via wavelet domain entropy and directional stripe index. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2026
3. Tai Hyoung Rhee, Dong-guw Lee, and Ayoung Kim. Tir-diffusion: Diffusion-based thermal infrared image denoising via latent and wavelet domain optimization. *ICRA 2025 Thermal Infrared in Robotics Workshop*, 2025
4. Jeongyun Kim, Jeongho Noh, Dong-Guw Lee, and Ayoung Kim. Transplat: Surface embedding-guided 3d gaussian splatting for transparent object manipulation. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Atlanta, May. 2025
5. Dong-Guw Lee, Myung-Hwan Jeon, Younggun Cho, and Ayoung Kim. Edge-guided multi-domain rgb-to-tir image translation for training vision tasks with challenging labels. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, London, May. 2023
6. Dong-Guw Lee, Kyu-Seob Song, Young-Hoon Nho, Ayoung Kim, and Dong-Soo Kwon. Sequential thermal image-based adult and baby detection robust to thermal residual heat marks. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 13120–13127, Kyoto, Oct. 2022

POSITIONS

Graduate Student Research Assistant

Feb. 2022 - 2026

Robust Perception and Mobile Robotics Laboratory (RPM)
Department of Mechanical Engineering, SNU

Head Graduate Student Teaching Assistant

Fall 2023

Machine Learning for Mechanical Engineering
Department of Mechanical Engineering, Seoul National University (SNU)

Graduate Student Research Assistant

Feb. 2020 - Feb. 2022

Telerobotics and Control Laboratory (TCL)
Department of Mechanical Engineering, Korea Advanced Institute of Science Technology (KAIST)

RESEARCH EXPERIENCE

Underwater Robotic Monitoring of Floating Infrastructure, Ministry of Land, Infrastructure and Transport

Project Lead

2023–Present
RPM Robotics Lab

- Led the development of underwater perception modules, including image dehazing, open-vocabulary object detection and segmentation, and vision-based image mosaicing.
- Conducted tank and at-sea trials with underwater robots in collaboration with POSTECH.
- Developing a training-free method for biofouling segmentation in underwater infrastructure imagery.

Thermal Imaging for Smart Construction Environments, Ministry of Land, Infrastructure and Transport

Graduate Student Research Assistant

2023–Present
RPM Robotics Lab

- Developed a state-of-the-art thermal object detection system for construction-site monitoring.
- Developing a VLM-based segmentation module for building crack segmentation from thermal imagery.

**Thermal Image-Based Navigation and Shipyard Monitoring,
Samsung Heavy Industries**

Project Lead

2025

RPM Robotics Lab

- Led the development of a synthetic data generation pipeline and a real-time thermal object detector for rare and underrepresented shipyard object classes.
- Optimizing the detection of workers, transport vehicles, and unknown obstacles for robust day-and-night operation.

Development and Operation of Living Labs for AI-Based Safety Monitoring in Residential and Industrial Environments,

Electronics and Telecommunications Research Institute (ETRI)

Graduate Student Research Assistant

2020–2021

KAIST TCL

- Collected and managed multimodal datasets for residential and industrial safety applications, including a thermal-image dataset for infant burn-injury prevention and an IMU dataset for construction-worker safety-harness monitoring.
- Obtained Institutional Review Board (IRB) approval for both data-collection protocols.
- Developed thermal-image-based adult and infant detection algorithms and IMU-based safety-harness usage monitoring methods using the collected datasets.

INVITED TALKS

1. Talk on Thermal Perception for Robot Autonomy, Samsung Heavy Industries Research Institute, Daejeon, Korea, Sep., 2024.
2. Journal Invitation Talk on Thermal image-based Place Recognition, International Conference on Ubiquitous Robots (UR), New York, USA, July., 2024.

SERVICES

Workshop & Tutorial Organizer

- Workshop Lead for Workshop on Thermal Infrared in Robotics, ICRA 2025

Reviewer

- IEEE Robotics and Automation Letters (RA-L).
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR).
- European Conference on Computer Vision (ECCV).
- Conference on Neural Information Processing Systems (Neurips).
- IEEE/CVF International Conference on Computer Vision (ICCV).
- IEEE International Conference on Robotics and Automation (ICRA).
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).
- IEEE International Conference on Ubiquitous Robots (UR).
- Nature Scientific Reports.

LANGUAGES & SKILLS

- Korean (native), English (native)
- MATLAB, C/C++, Python, Pytorch, Tensorflow, ROS

Revised July 23, 2026