Jooyoung Yoo

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Education

University of Southern California — Expected 2024
M.S. in Spatial Data Science (Advisor: Dr. John Wilson, and Dr. Yi Qi)

Myongji University — 2020
M.S. in Data Technology (Advisor: Dr. Daewon Kim)

Myongji University — 2016
B.E. in Information and Communication Engineering

Publications

Jooyoung Yoo, Abdullah Alfarrarjeh, Krish Sukhani, Seon Ho Kim, and Cyrus Shahabi (2024). "STVD: Synchronized Truck Video Dataset with RGB and IR Cameras for Continuous Truck Traffic Monitoring," *IEEE International Workshop on AI and Computer Science, Dec. 2024* [Accepted]

Jooyoung Yoo, Reem Emad Shtaiwi, Mohammad Yasin, Dweep Trivedi, Abdullah Alfarrarjeh, Amani Abu Jabal, Seon Ho Kim (2024), "Towards Real-world Deployment of Deep Learning Solutions for Global Road Damage Detection and Classification," *IEEE Big Data, Big Data Cup Challenge (ORDDC'2024)*, **awarded the Bronze Prize in an international challenge**. [Accepted]

Siqin Wang, **Jooyoung Yoo**, Wenhui Cai, Fan Yang, Xiao Huang, Qian Chayn Sun, Shaokun Lyu (2024). "Reducing the social inequity of neighborhood visual environment in Los Angeles through computer vision and multi-model machine learning," [*Sustainable Cities and Society*-Under Review]

Jooyoung Yoo, Seon Ho Kim, Krish Sukhani, Min Sang Yoo, and Cyrus Shahabi (2024). "Truck Detection and Counting in Low-Light Condition: Do We Need Infrared Camera?," *In IEEE International Conference on Big Data and Smart Computing*

Jooyoung Yoo, and Daewon Kim (2020). "Development of a new pedestrian avoidance algorithm considering a social distance for social robots," *Journal of Broadcast Engineering* 25.5 : 734-741.

Jooyoung Yoo, and Jin Lee Park (2020). "Examining the socialization of grit and the effects of peer community and teacher closeness using longitudinal social network analysis," *Journal of Learner-Centered Curriculum and Instruction*

Jooyoung Yoo, Joomin Kim, Sungsik Yun, and Daewon Kim (2013). "Development of a scenario-based work distribution function for teleoperation under multi-user and multi-robot environments," *IEEE International Symposium on Robotics 2013*

Research Experience

Individual Tree Detection, Segmentation for Urban Greening Project — May. 2024 – Present
Full-time Student Researcher (Advisor: Dr. John Wilson, and Dr. Yi Qi)

- Developed detection and segmentation models using aerial imagery to identify and segment individual trees.
- Designed a training and prediction workflow for LA city officials, enabling them to count trees and calculate canopy areas using GIS, without the need for coding skills.

Homeless Encampment Detection and Counting Project — Feb. 2024 – Present
Full-time Student Researcher (Advisor: Dr. Abdullah Alfarrarjeh)

- Led a team in data cleaning and statistical analysis, including labeling and developing an ensemble model capable of handling various conditions (occlusion, truncation, blurring) using mobile cameras.
- Conducted comparative studies on 144 trained models and preparing a research paper.

Spatial Pattern Mapping using Street View: Human Perception Project Mar. 2024 – Sep. 2024
Volunteer Student Researcher (Advisor: Dr. Siqin Wang)

- Conducted data collection at 50-meter intervals across Los Angeles County using GIS software, Python libraries, and 360-degree imagery from Google and Mapillary Street View APIs.
- Applied machine learning methods, including segmentation and classification, to analyze Street View imagery for sentiment analysis of various locations.
- Visualized spatial patterns of six human emotions (Beautiful, Wealthy, Livable, Safe, Boring, Depressing) to map urban perception.

Truck Detection and Counting Project May. 2023 – May. 2024
Full-time Student Researcher (Advisor: Dr. Seon Ho Kim)

- Published two research papers as the first author.
- Project Leader: Led a team of 7 in synchronized data collection and labeling with RGB and infrared videos, conducted experiments.
- Provided research data to USC Keck Medical School for environmental monitoring, contributing to studies on the impact of truck traffic on residential areas.
- Utilized YOLOv5 for object detection and DeepSORT model for tracking to detect and count trucks in various light conditions.
- Installed cameras and laptops at residential areas near truck routes for a 7-day monitoring period, demonstrating the effectiveness of infrared camera detection.

Web-based Academic Integration Platform for STEM Students Project Feb. 2020 – Sep. 2022
Research Assistant, Web Developer (Advisor: Dr. Enyoung Kang)
NRF(National Research Foundation of Korea) Fund

- Led the development of a web service for data collection and visualization involving STEM students from four universities.
- Designed and modeled database structures, including the creation of ER diagrams and development of database schema.
- Conducted longitudinal network analysis to observe and analyze changes in student friendships and academic motivation over time.

Employment

Spatial Data Lab (SDL) at Harvard University, *Intern* present

Spatial Sciences Institute of USC, *Full-time Student Researcher* present

Keck School of Medicine of USC, *Full-time Student Researcher* 2023 – 2024

Integrated Media Systems Center of USC, *Teaching Assistant*, *Student Researcher* 2023 – 2024

Joongbu University, *Web Developer* 2020 – 2022

Techsphere, *Computer Vision AI Software Engineer* 2020 – 2021

Myongji University, *Research Assistant*, *Teaching Assistant* 2018 – 2020

Konkuk University, *Web Developer* 2018

Korean Dictionary, *Co-founder* 2013 – 2017
†Non-profit Organization

Awards

Bronze Prize(3rd Place), Optimized Road Damage Detection Challenge 2024, IEEE BigData 2024
Best Presenter – The 23rd KOCSEA Technical Symposium 2023
Best Presenter – USC CKIDS DataFest Fall 2022 2022

Skills

DL Frameworks: : Pytorch, Keras, Tensorflow, Ultralytics
Languages: Python, R, C++, Java, JavaScript, SQL
Other: Git, Linux, Matlab, ArcGIS Pro, QGIS, SPSS, LaTeX **– All professional proficiency or above**