Jooyoung Yoo

Contact Information

yoojooyo@usc.edu
https://jooyoung01.github.io

Education

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

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, 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.

Enyoung Kang, **Jooyoung Yoo** and et al. (2021). "Curriculum-related teaching and learning supplementary materials for students with disabilities(reorganization of curriculum)", *National Institute of Special Education*, ISBN: 978-89-6095-013-9

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*

Jooyoung Yoo (2013), "Super Developer's Dream: Challenging, questioning and thinking", Seoul: *Micro Software* (pp.194-196), ISSN: 1227-6227.

Research Experience

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

- Developed detection and segmentation models using aerial and satellite imagery to identify and segment individual trees.
- Conducted multimodal training, integrating RGB, Near-Infrared, and LiDAR data to build robust tree detection models.
- Implemented transfer learning by training and fine-tuning YOLOv8 and Mask R-CNN models within ArcGIS.
- Led a team in the systematic collection, cleaning, and labeling of tree canopy data, managing role distribution and overseeing all project phases.
- Designed a training and prediction workflow for city and county officials, enabling them to count trees and calculate canopy areas using GIS, without the need for coding skills.

Spatial Pattern Mapping using Street View: Human Perception Project — Mar. 2024 – Present
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.

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
- Developed an ensemble model capable of handling various conditions (occluded, truncated, blurred) with mobile cameras
- Conducting comparative studies on 144 trained models and preparing a research paper.

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

- Led a team of 7 in synchronized data collection and labeling with RGB and infrared videos, conducted experiments, and published the research paper as the first author
- 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.
- Provided research data to USC Keck Medical School for environmental monitoring, contributing to studies on the impact of truck traffic on residential areas.

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 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

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**