






JINYOON KIM

Computer Vision & Machine Learning & Interpretability

CONTACT

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EDUCATION

B.S. Computer Science
Pennsylvania State University
Harrisburg
2017-2019, 2022-2024
GPA: 3.38 / 4.00

SKILLS

Python and Java
PyTorch and Tensorflow
CNN and Transformers
Database (Mongo DB)
Web Development(Flask)
HTML/CSS
Git

CAREER OBJECTIVE

I am a Computer Science graduate specializing in machine learning, dedicated to enhancing AI's ability to understand and interact within our world. My passion lies in advancing research in **computer vision, transformers, and interpretable/explainable AI**, with a focus on developing AI solutions that benefit society at large. I am committed to contribute for AI innovations that not only can comprehend complex human interactions but also brings transformative advancements. My goal is to ensure that the technology I develop is accessible and adaptable to the diverse needs of communities worldwide, from remote regions to urban centers. For details on my projects and the latest research content, please visit my [website](#).

RESEARCH EXPERIENCES

“Automated Data Labeling for Object Detection via Iterative Instance Segmentation” International Conference on Machine Learning and Applications (ICMLA 2023),

- As the First Author, developed and programmed an auto-labeling system using YOLOv8 with its instance segmentation technique, integrating with uncertainty-based correction algorithm and iterative training to reduce the need for manual labeling
- Adopted the concepts of semi-supervised and active learning methods to refine the system
- Processed and adapted the PlantVillage Dataset, featuring over 20,000 data instances for the experiments
- Set new benchmarks in accuracy and efficiency, outperforming traditional models and the model conventionally trained on fully human-labeled dataset

“Automated image data segmentation via self-iterative training” (Book version)

- Extension version of "Automated Data Labeling for Object Detection via Iterative Instance Segmentation," prepared for the book publication associated with ICMLA 2023
- Publisher: Taylor and Francis
- Integration of HAM10000 dataset and OneFormer vision transformer model into previous research on automated data labeling for object detection for the comparison.
- Experimental setup designed to test the system's adaptability and performance under conditions of reduced data availability (20% to 60% reductions).
- Exploration of data augmentation strategies to counteract performance drops due to data reduction.

- Analysis of the effects of data imbalance and feature variations on the model, with proposed mitigation solutions.
- Highlighting the system's strengths and limitations through new experimental scenarios, offering insights into scalability and efficiency.

Skin Lesion Detection Paper research utilizing united system of skin image processing regarding DCA and upgraded YOLOv8 architecture with new modules (On Progress)

- As the first author, I derived this research from the project with Hershey Medical Center for Skin Cancer Detection Web App.
- The purpose of the research is to develop an all-in-one framework that integrates various techniques and pipelines with adjusted architectures for accurate skin lesion detection.
- It incorporates multiple algorithms and models capable of detecting confounding factors such as dark corner areas and hairs from skin image data, then removes them to ensure the model's correct interpretation of the information.
- An interpretability framework will be integrated to analyze the model's comprehension of the image data and to assess how the removal of confounding factors affects the results.
- The framework enhances the accuracy of the YOLOv8 object detection model by incorporating additional modules, such as BiFPN and an attention module.
- A range of vision models, from the basic YOLOv8 model to vision transformers, were experimented with to compare performance.

SERVICE EXPERIENCE

Signal Intelligent Agent - Mandatory Military Service, Republic of Korea (2019-2021)

- Fulfilled national duty of a Korean citizen by serving in a critical intelligence role
- Gained Insights: Stress resistance, work ethic, gratitude, and appreciation
- Specific details cannot be discussed because of its security issues

CLUB ACTIVITY

- Association for Computing Machinery(ACM) club, Computer science club at Penn State Harrisburg for the group of students that are interested in programming contests and hackathons (2021-2022).
- Robotics Club: collaborated with the students at Dallas Lutheran High School who were interested in both mechanical building and software programming of robots which were used for task solving competitions (2015-2017).