Mo Zhou

Boulder, CO | Mo.Zhou@colorado.edu | momoaolig.github.io | linkedin.com/in/max-mz | github.com/momoaolig

Research Interests

Multimodal learning; Image generation; Object-part processing; Contrastive learning; Computer vision

Education

University of Colorado Boulder Aug 2023 – Present
MS in Computer Science GPA: 3.9/4.0

Nanjing University of Posts and Telecommunications Aug 2018 - June 2022
BE in Information Security GPA: 84/100

Research Experience

IVC Group, University of Colorado Boulder June 2024 - Present
Independent Study; Advised by Prof. Danna Gurari

- Exploring the potential of state-of-the-art generative models on object-part-level tasks;
- Developing models that can leverage part annotation datasets and generate images by composing parts from different objects together.

Class Projects

CLIP on Object Part Segmentation[PDF] | *Pytorch* Sep 2024
github.com/momoaolig/CLIPonPartSegmentation

- Studying the performance of CLIP on object part segmentation tasks;

Scientific Paper Review System | *Crewai, AWS bedrock* May 2024

- Built a paper review system based on LLM agents and added Claude3.5-Sonnet agents to assess the novelty;
- Developed tool functions to give agents access to semantic scholar database and retrieve recommended papers for comparison.

Distracted Driver Detection[PDF] | *Pytorch, Tensorflow, Kaggle* Apr 2024
github.com/momoaolig/Distracted-Driver-Detection

- Developed and combined CNN models including ResNet50 and VGG16, transformer models including ViT and swin, to perform multilabel classification on the action of the driver in the image;
- Got the highest accuracy of **98.89** with fine-tuned ResNet50, followed by 98.23 and 98.03 from VGG16 and ResNet+ViT.

Chat as a Service | *Python, TypeScript, PostgreSQL* Dec 2023

- Designed and implemented SQLAlchemy database models and Pydantic schemas with PostgreSQL;
- Developed services of operations on accounts, applications and organizations.

Music Separation on Kubernetes | *Python, GCP, Kubernetes, Docker, REST, Redis, Flask* Apr 2024

- Developed workers to receive music separation tasks and raw files from Redis queue and Minio bucket, do the separation, and push tracks to Minio bucket;
- Implemented Flask server to accept API requests, queued tasks with Redis, and stored music files in Minio raw data bucket for later tracks retrieval;
- Created docker images for Rest server and worker and deployed all the parts on Kubernetes.

TECHNICAL SKILLS

Languages: Python, JavaScript/TypeScript, C++, C

Technologies: Tensorflow, Pytorch, Wandb, Pandas, Numpy, Docker, Kubernetes, Hugging Faces, scikit-learn, High-performance Computing, Rest

Database: PostgreSQL, Redis, Minio

COURSEWORK

Recent Advances in Computer Vision, Machine Learning, Neural Network and Deep Learning, Natural Language Processing, Datacenter Scale Computing, Data Structure, Object Oriented Programming and C++, Embedded System and Development, Database Systems, Computer Networks, Operating System Internals and Design Principles, Computer Organization and Architecture, Fundamentals of Electric & Electronic Technology