İSMAİL ÇETİN

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Work Experience

Student Researcher - ITU Vision Lab (Advisor: Prof. Dr. Gozde Unal)

May 2022 - Jun 2023

Istanbul Technical University

- Completed CS224W (Graph Neural Networks), CS224N (Natural Language Processing) and CS231N (Deep Learning) by Stanford courses as well as their homeworks
- Completed a joint project between ITU Architecture and ITU Computer Engineering Faculty
- Studied state-of-the-art transformer papers in vision
- I have a broad range of interests in the deep learning field such as point clouds, diffusion, self-supervised learning, generative adversarial networks, transformers in vision and NLP, graph neural networks. I have trained a variety of object detection and segmentation models while working in the lab.

REM People, Internship, Computer Vision and Machine Learning Engineer

Jan 2023 - March 2023

- 3D Reconstruction and Structure from Motion using colmap and InstantNGP (NEural Radiance Fields)
- Developed an interface to demo the product to the management using Gradio and Streamlit.
- Created an object detection pipeline using YOLOv8 on AWS Sagemaker

REM People, Part-Time, Jr. Computer Vision and Machine Learning Engineer

March 2023 - Jun 2023

- Presented state-of-the-art self-supervised object detection and segmentation papers from top AI research companies (Meta AI, OpenAI)
- Obtained a Computer Vision Cloud Certificate from Google Cloud
- Used fastdup library to identify incorrect labels in object recognition.
- A mobile app to detect the objects in the captured scene and classify them to their corresponding Stock Keeping Units (SKU), using Tensorflow Lite and ONNX.

REM People, Full-Time, Mid. Computer Vision and Machine Learning Engineer

Jun 2023 - Aug 2024

- In my role, I lead the development of an iOS mobile application for YOLOv8 detection and segmentation, leveraging Objective-C, Swift, and Python. I trained state-of-the-art deep learning models for object detection and segmentation, converting them to CoreML versions for seamless integration. I also implemented a rectification pipeline for shelf images, ensuring accurate alignment and enhancement.
- Additionally, I developed a robust tracking pipeline using ByteTrack and BotSort algorithms to accurately detect and classify objects on a shelf from video input, creating a panoramic view for enhanced visualization.
- My work also included presenting advanced models such as FlowNet, GMFlow, FlowFormer, MaskFlowNet for optical flow, Denoising Diffusion GAN, Stable Diffusion, Noise Conditioned Score Networks, Latent Diffusion Models to teach the team how GenAI models nowadays work, and , Zero-DCE, Retinex-Former, Real-ESRGAN, BSRGAN, StableSR, and LDM-SR to increase the resolution and mitigate the photos taken in the dark. I have incorporated StableSR and BSRGAN to improve image quality.
- My work also involved using and developing MilvusDB vector database to provide sales team. Metric model of our company is somewhat limited so using the embeddings of the product crops, we find similar crops using milvus and improve our performance 10 - 15 % for poorly find images.
- Implementation of many NLP models for document processing (Google BERT, Vision Transformer for classification, Diffusion Transformer etc.)
- LLIE Enhancement of images with many dark regions (This was my work with Assoc. Prof. Dr. Aykut Erdem before joining Koc, then I have used this model to both find the darkness and lighten up these images, and incorporate our pipeline)

Research Experience

Graduate Researcher - Koc University (Advisor: Assoc. Prof. Aykut Erdem)

Feb 2024 - Present

- I am now working on a course project on latent diffusion based blind image super resolution (LDM-BSR)
- I took NLP and Deep Unsupervised Learning course. In NLP we developed an AI agent that can convert natural language queries into SQL commands and then execute them (Grounding in action)
- Created a diffusion model that can conditionally sample enhanced image, using the information from low-light image. Conditional low-light image enhancement model using LoL dataset and Denoising Diffusion Gan by Arash Vahdat (NVIDIA). Trained a DDIM and pure DDPM model with light-up images as well.

Skills

- PyTorch
- Tensorflow
- JAX
- Open3D
- Python
- Swift
- C++
- Objective-C
- Java
- Rust
- JavaScript
- TypeScript
- Tailwind
- React
- React Native
- FastAPI
- Flask
- NextJS
- GCP
- AWS
- Huawei Cloud
- MilvusDB
- Kubernetes
- Docker

Education

Istanbul Technical University (Bachelor's - Computer Engineering) **Sep 2018 - Jun 2023**
Advisor: Prof. Dr. Gozde Unal

Koc University (Master's - Computer Science and Engineering) **Feb 2024 - present**
Advisor: Assoc Prof. Aykut Erdem

Projects

- Publisto - Software Engineering Coursework - (React Front-end + React-Native cross-platform completeUI)
- REM People Product-Shelf SKU Recognizer-Rectifier (Native Android and Native iOS codebase, conversion from PyTorch to CoreML as well as rectification)
- ITU Architecture - Computer Engineering Department Joint Project (Walkability of a given street image, using PyTorch segmentation models and openmmlab)

Relevant Coursework

- Deep Learning (Graduate Level A++)
- Computer Vision (A++)
- Artificial Intelligence
- Machine Learning (A++)
- Software Engineering

TOEFL: 103 / 120

- Probability and Statistics
- Discrete Mathematics
- Data Structures & Algorithms (A++)
- Algorithms Design (A++)
- Natural Language Processing (A++)
- DeepUnsupervised Learning (COMP547 - Koc)

Interests

- Computer Graphics
- Physically Based Rendering
- Large Language and Multimodal Models
- Reinforcement Learning and Robotics
- Distributed Systems
- Self-Supervised and Unsupervised Learning
- Graph Neural Networks