Rigved Shirvalkar

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EDUCATION

Bachelor of Technology in Electronics & Computer Engineering
Amrita School of Engineering
2020 – 2024

SKILLS

- Deep Learning
- Machine Learning
- PyTorch
- TensorFlow
- Python
- Pandas
- Numpy
- Jupyter
- Git
- Web Development
- ReactJS
- Django

PROFESSIONAL EXPERIENCE

FoxTradingSolutions
Internship program in Machine Learning
01/2021 – 03/2021

- Trained models to fit datasets with the highest accuracy possible
- Solved some case studies on machine learning problems

Traboda
Web Developer
03/2021 – 07/2021

- Added features and solved issues in both backend and frontend to simplify UI and UX
- Used CSS, ReactJS and Django

Red Hen Lab
Open Source project Contributor
06/2023 – present

- Creating a multimodal Deep Learning Pipeline for generating captions that explain the meanings of speech gestures in Christian Art Images
- Applied Style transfer using AdaIn to generate data similar to art images for fine-tuning the YOLO V8 pose detection model
- Used a pre-trained pose detection transformer from a research paper that specifically trained it on art images
- Created and annotated over 2000 images for training the palm gesture detection model using YOLO
- Created another dataset of 1000 images for classifying and detecting the person in the images and further improving the caption generated by the pipeline.
- Trained YOLO V8 classification and object detection models on these datasets, and created a pipeline combining them to provide the final output.
- Currently working on applying RAG (Retrieval-Augmented Generation) to explain meaning and symbolism of the gestures used in the image.

RESEARCH WORK

Methods for Bias Mitigation for computer vision models:

- Conducted Research under Dr. Geetha M, Vice Chairperson , School of Computing, Amritapuri | Assistant Professor (Sl. Gd.) , School of Computing, Amritapuri
- Paper accepted in 7th International Conference on Electronics, Material Engineering and Nano-Technology

PROJECTS

YOLO V8 - CAM
The first package for applying EigenCAM on the newly released YOLO V8 model.
- Can be used on YOLO V8 classification and object detection models.
- It generates the heatmap to help visualise which region of the image, the model is focusing on

Fine-tuning neural network from scratch using LoRA
- Trained a linear network on the MNIST dataset and then fine-tuned it using LoRA from scratch
- Implemented the concept of Low Rank Adaptation to understand it better.
- Achieved an increased accuracy for the specific digit the LoRA was trained on, with the ability to
- control the extent of its effects on the model's complete output using PyTorch from scratch.

German To English Translator
- Implemented and Trained a transformer model from scratch to perform English to Italian translation using the Opus_books dataset for training
- Made this to understand more about the transformer model. My blog about it can be found at https://medium.com/@rigvedrs/a-basic-idea-of-transformers-758f0bfd43c6
- Used bleu score as a metric for evaluation

FaceRec
Custom face recognition app trained using Siamese Neural Network
- Trained locally using custom face dataset for positives and LFW dataset for negatives
- App made using Kivy for User Interface

NFS - Neural Net from Scratch
- Neural Network Created from Scratch
- Using only Python and Numpy

Enhancing Pneumonia Detection Accuracy through ResNet-Based Deep Learning Models and Ensemble Techniques: A Study Using Chest X-Ray Images
- Conducted research under Ms. Remya, Vice Chairperson, Electronics and Communication Engineering, School of Engineering, Amritapuri | Asst. Professor, Electronics and Communication Engineering, School of Engineering, Amritapuri
- Paper accepted in 8th International Conference on Smart Trends for Computing and Communications

Methods for Underwater Image Enhancement
- Conducting research under Dr. Akshara P. Byju, Assistant Professor, School of Computing, Amritapuri
- Developing method for enhancing underwater image quality using deep learning algorithms

COURSES

Neural Networks and Deep Learning
an online non-credit course authorized by DeepLearning.AI and offered through Coursera

Structuring Machine Learning Projects
an online non-credit course authorized by DeepLearning.AI and offered through Coursera

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
an online non-credit course authorized by DeepLearning.AI and offered through Coursera

Introduction to Deep Learning Using PyTorch
Udacity

CS50's Introduction to Artificial Intelligence with Python
Offered by EdX

HarvardX PH125.8x Data Science: Machine Learning
Offered on EdX

IBM Deep Learning with Python and PyTorch
Offered on EdX