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
- Natural Language Processing
- Computer Vision
- Python
- C++
- Java
- 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
Full Stack 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

Mitigating Bias in Image Classification: Pretraining on Diverse Data for Improved Generalization

- 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