Sandeep Pediredla

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Education

Indian Institute Of Science; Bengaluru, India **Aug 2022 – Present**
Master of Technology (M.Tech), Artificial Intelligence(AI) *GPA: 7.0/10*

Gayatri Vidya Parishad; Visakhapatnam, India **Aug 2016 - May 2019**
Bachelor of Technology (B.Tech), Electrical Engineering (EE) *GPA: 9.07/10*

Relevant Coursework

- Stochastic Methods and Applications
- Computational Methods of Optimization
- Linear Algebra and Applications
- Data Structures and Algorithms
- Pattern Recognition and Neural Networks
- Advanced Image Processing
- Human Machine Interface
- Data Analytics
- Advanced Deep Representation Learning
- Computer Vision

Internship

General Electric **May 2023 - July 2023**
Edison Engineer Development Program (EEDP) Intern, TSD Tools, Aerospace *Bengaluru, India*

- Created a chatbot designed to aid clients in resolving issues by drawing on solutions from previously addressed concerns for the NGT tool which **reduced the manual issue resolution time by 50**%.
- Developed and implemented a **Bag-of-Words-Based Chatbot** proficient in extracting information from PDFs, utilizing predefined question-answer pairs, and delivering comprehensive end-to-end functionality.
- Engineered and designed an **API-based Chatbot** that leverages responses from the initial chatbot and integrates OpenAI GPT-3 API for advanced response generation.
- **Skills**: BoW, Word2Vec, NLTK, Tkinter

Projects

Image Generation using β-VAE | *Variational Auto-Encoders, Generative Modelling, PyTorch* **September 2023**

- Trained a β-VAE with varying beta values, assessing its impact on the trade-off between image reconstruction quality and **latent space disentanglement**.
- Conducted **posterior inference** and **latent space interpolation** experiments for 10 image pairs, showcasing the model's ability to generate diverse images and explore the latent space structure.

Retinal Image Segmentation | *CNN, Image Segmentation, PyTorch* **February 2023**

- Implemented a Retinal Blood Vessel Segmentation model by adapting the **ResNet18-based Fully Convolutional Network (FCN)** architecture for use on the DRIVE(Digital Retinal Images for Vessel Extraction) dataset.
- Evaluated the models' performance by computing key metrics, including overall pixel accuracy and **mean Intersection over Union (meanIOU)**. Achieved a pixel accuracy of 80.10%.

Classical ML Algorithms **Jan. 2023 - April 2023**

- Implemented Linear Regression, Logistic Regression, SVM Classifier, Decision Trees, AdaBoost, Naive Bayes' Classifier, K-Means Clustering on various Datasets from scratch and analysed the performance metrics.

Test-Time Adaptation for Image Segmentation | *Segmentation, PyTorch* **Apr 2023 – Present**

- Previously worked on applying the Segment Anything Model (SAM) to detect PCB anomalies.
- Currently working to develop a test-time adaptation technique for enhanced image segmentation.
- Exploring adaptive strategies for specific test scenarios to improve segmentation accuracy and robustness.
- Optimizing the model for medical image segmentation and exploring adaptability for PCB anomaly detection.

Personal Projects

Vehicle-detection | *YOLO, Object Recognition* **January 2019**

- Built a deep-learning model in which vehicles will be localized in the live feed (Waymo) using **YOLO V3** convolutional neural network and transmit centre coordinates of the vehicles.
- Encode data of vehicle movements using cameras and localization algorithm into relative co-ordinates and broadcast to travellers.

Neural Machine Translation | *LSTMs, Transformers* **July 2023**

- Compared the performance of an **LSTM encoder-decoder** with an attention-based **Transformer** model for English-to-German translation tasks and observed an improvisation in **BLEU score** from 28.00 to 29.3)

Experience

Vikram Sarabhai Space Centre (ISRO) **Feb. 2022 - July 2022**

Technical Assistant, Trisonic Wind Tunnel *Thiruvananthapuram, India*

- Worked on the setup of the Trisonic Wind Tunnel, ensuring precise data acquisition and instrumentation alignment.
- Supervised the installation of a 1500 KW motor, set up PLCs, and enhanced data acquisition for aerodynamic analysis.
- Collaborated in interdisciplinary teams, showcasing adaptability and effective communication.

Technical Skills

Languages: Python, MATLAB, LaTeX, C, Basic understanding of SQL

Technologies: Pytorch, Numpy, Pandas, Scipy, Matplotlib, Seaborn, Scikitlearn, OpenCV

Software/Frameworks: Google Colab, VS Code, Anaconda, Linux, GitHub

Achievements | Extracurricular

- Student Placement Coordinator for the AI department
- Secured All India **Rank 76** in GATE EE 2022
- Secured All India **Rank 35** in GATE IN 2022
- Acheived Department **Rank 2** among undergraduate students
- Active Volunteer in the Animal Welfare Group of IISc, Bangalore