Syed Abdul Khader

Research Engineer | Vision and Language Model Geek

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SKILLS

Languages and Frameworks: Python, SQL, Hugginface, FastAPI, PyTorch, LlamaIndex, DSPy
Technologies: LLMs, Computer Vision, NLP, RAG, Diffusion Models, RestAPI, Docker, Git, AWS, Linux.

EXPERIENCE

Surgical AI Lab (MGH, Harvard) Boston, MA
Research Engineer April 2023 - Present

- Developed Binary and Multiclass Video Object Segmentation(VOS) system on surgical video data, achieving sota results, with mean IOU of **92.26%** and **74.43%** respectively.
- Incorporated SAM-Med2D and XMem++ to do auto-segmentation of anatomy and tools on the videos reducing annotation time for each case from **4 weeks to 1 week**.
- Presented two Proof of Concepts, a Vision Language system to generate post-operative reports and summaries using surgical videos and a RAG system to query based on past reports.

Infinstor Remote
Data Scientist June 2021 - July 2022

- Architected end to end Document Understanding pipeline to extract and analyse information from document images using LayoutLM series.
- Deployed an OCR model developed with CNN-LSTM-CTC Loss, to reduce the manual process **turn around time by 90%**.
- SQL Queries and Cloudwatch logs Anomaly detection using LogBERT. Blog post

Infor Hyderabad, India
Dev Bussines Analyst July 2019 - April 2021

- Led the functional integration of Infor ERPs with Microsoft, and Salesforce CRMs.
- Automated Customer Data Migration, reducing migration duration from 2 days to minutes.
- Trained new developers on Python, with a satisfaction score of **97%**

PUBLICATIONS

- **Medical Surgery Stream Segmentation to Detect and Track Robotic Tools**. *IEEE International Conference on Artificial Intelligence for Medicine, Health, and Care*, 2024
- **Utilizing Artificial Intelligence for Surgical Anatomy and Phase Recognition in Thoracic Surgery**. *IEEE International Conference on Biomedical Engineering Instrumentation*, 2024
- **Automatic Detection of the Pulmonary Artery During Robotic Right Lower Lobectomy Using Deep Learning**. *103rd Annual Meeting of The American Association for Thoracic Surgery*, 2023

PROJECTS

nanoChatGPT *Project Link:* nanoChatGPT

- Supervised finetuning GPT-2 variants on UltraChat dataset, along with Reward model training on the SFT model with LoRA. Achieved **60-68%** accuracy in reward model training on GPT-2 variants.

Panoptic Segmentation on Custom Dataset using DETR *Project Link:* DETR

- **mAP0.5:0.95 of 61%** for bbox and Panoptic Quality(PQ) of **54.6%** over both things and stuff

Captcha Recognition with Convolution-RNN + CTC Loss *Project Link:* TextFromImage

- Trained a Conv-RNN model with CTC Loss to identify text in the images, with an accuracy of **85%**

EDUCATION

Plaksha University August 2022 — June 2023
Technology Leaders Program GPA: 9.53
Awards: Best student commitee and Spirit of Plaksha Credit standing: Gold Medalist

JNTUH College of Engineering 2014 — 2019
Bachelors in Technology Percentage: 80