Ashwin Sateesh Kumar

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SUMMARY

Driven ML Engineer with 3+ years of experience in statistical analysis, model-development, AI/ML implementation. Proficient in bridging theory and real-world systems. Thrives in fast-paced environments, leveraging leadership and teamwork abilities to deliver innovative solutions. **Available to start immediately, flexible regarding relocation, and open to remote work**

EDUCATION

Northeastern University Boston, MA | December 2023

Master of Science in Data Science ***(GPA: 3.8/4)***

- ***Courses:*** *Algorithms, Machine Learning, Data Mining, Database Management Systems, Deep Learning*

PES Institute of Technology Bengaluru, India | July 2019

Bachelor of Engineering in Electronics and Communications

- ***Courses:*** *Data Structures (OOPs), Linear Algebra, Artificial Neural Networks, Pattern Recognition, Image Processing, Signal Processing*

TECHNICAL SKILLS

- **Programming Languages**: Python, R (dplyr, ggplot, tidyverse) , SQL (MySQL, NoSQL), Java
- **Frameworks:** Scikit-Learn, TensorFlow, Keras, PyTorch, OpenCV, Pandas, NumPy, Matplotlib, NLTK, Hugging Face, LangChain
- **Tools & Technologies:** Jupyter Notebooks, RStudio, Git, Tableau, AWS (Sagemaker, S3, EC2), GCP, Hadoop, Docker, CUDA
- **Skills:** System Design, Hypothesis Testing, Visualization, Optimization, NLP, Computer Vision, Agile (Scrum,Jira,Confluence), CI/CD

WORK EXPERIENCE

Machine Learning Engineer – *Abecedarian* Boston, MA | January 2024 – Present

- Led the design and development of an **agile Agricultural Policy Recommendation System by integrating ML models** - Vision Transformers with PCA and Xgboost for remote sensing data, LSTM for supply-demand data, and BERT for textual news interpretation
- **Derived trends and insights** from the multivariate predictions by **engineering prompts** and **orchestrating 7 LLM chains** on LangChain
- **Enabled data-driven decision-making for stakeholders** by fine-tuning GPT-3.5 with OpenAI API to generate policy recommendations, coupled with a **scalable cloud-based RAG architecture** and a Streamlit interface **for seamless deployment and user interaction**
- Engineered a **scalable Yoga Assistant** using fine-tuned GPT-3.5, implementing **parallel queue-based fine-tuning** and **web scraping for real-time updates**, with Chainlit UI integration and **perplexity score for benchmarking**, achieving **2x reduction in model latency**
- Integrated multimodal capabilities by **fine-tuning Stable Diffusion** for yoga posture visualization, leveraging **CLIP score** for evaluation

Research Assistant (Gen AI) – *Northeastern University* Boston, MA | July 2023 – November 2023

- Led the development of a **multi-modal variational autoencoders** (VAE) with convnets (U-Net) and transformers (BERT) as encoders and decoders, **effectively capturing complex image-text relationships** in political social media (Instagram) data with 400,000 records
- **Facilitated disentangled representation learning** and **discovered generative factors** by exploring latent vectors, **enabling controlled robust image and text reconstruction** and nuanced understanding of political narratives as portrayed through social media imagery
- Deployed the model on GCP, achieving remarkable results in **generating images from text and vice versa**. **Applied quantization methods** to accelerate processing by 30%, **optimizing multi-modal data analysis workflows**

Machine Learning Engineer Intern, R&D - *Signify (Phillips Lighting*) Boston, MA | June 2022 – December 2022

- Designed and integrated an **Augmented Reality (AR) based Android application** in Unity 3D, using **REST-API** to activate dynamic shows on Phillips lighting devices, **enhancing user interaction**
- **Enhanced household lighting strategies for home automation** of 18 homes and **optimized plant growth strategies** of medical cannabis cultivars **by forecasting lighting scenes** using SARIMAX and Xgboost, achieving 97% accuracy
- **Delivered a User Re-identification system proof of concept** to stakeholders for **personalized home automation**, featuring **custom developed CNN based weighted omniscale feature learning method**, achieving mean average precision of 0.95

Trainee Software Engineer, Machine Learning - *KPIT Technologies Ltd* Bengaluru, India | July 2019 – November 2020

- Developed a **custom U-Net-based semantic segmentation** model for **precise spatial detections in traffic scenes** with 0.89 IoU
- **Improved annotation of 1 million images** for a BMW Autonomous vehicle's model using **Transfer Learning and HIL** methods
- Devised an **object detection and monitoring** prototype for **Advanced Driver Assistance System** using **Vision and Radar Sensor Fusion**

PROJECTS

HealthBot: Intelligent Healthcare Assistant using LLMs Python | PyTorch | Hugging Face | Generative AI

- Developed a healthcare chatbot, achieving a F1 score of 0.96 in disease classification with Bi-RNNs, GloVe embeddings, and a BERT-enhanced NER system; fine-tuned GPT-2 using LoRA and reinforcement learning (RLHF) for precise semantic responses

Video Speech Detection and Caption Generation Python | Tensorflow | OpenCV | Transfer Learning | NLU

- Orchestrated an end-to-end lip reading and caption generation pipeline, integrating face detection, feature extraction (RESNET-50), and sequential modelling with attention-based LSTM/Transformers, achieving 91.3% accuracy in converting video speech to text