Butchi Venkatesh Adari

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Education

Masters in Robotics Engineering - GPA:3.8/4.0 **Aug 2023 - May 2025 (Expected)**
Worcester Polytechnic Institute *Worcester, Massachusetts*

PG Certification of AI & ML **June 2020 - May 2021**
IIT Guwahati (Remote)

Bachelors in Computer science and Engineering - GPA:7.77/10 **July 2017 - May 2021**
Anil Neerukonda Institute of Technology and Sciences *Visakhapatnam, India*

Experience

ELPIS LAB | Worcester Polytechnic Institute

Graduate Researcher *Jan 2024 - Ongoing*

Currently working on a project focused on fine-tuning Apple's Depth-Pro model for monocular depth estimation, reduced error from 10 cm to 3-4 cm. Developed a Grasp Transformer to predict grasp poses from RGB images and predicted monocular depth, with testing ongoing in PyBullet simulation and planned implementation on Universal Robot UR10.

Tata Consultancy Services | Hyderabad, India

Machine Learning Engineer *May 2022 - June 2023*

Designed and implemented a Computer Vision Pipeline for real-time object search using Google Vertex AI, integrating Continuous Integration and Continuous Deployment practices, and fine-tuned custom OCR models for extracting text from complex document layouts, improving document processing efficiency.

Python Developer *July 2021 - April 2022*

Partnered with Proximus and Vodafone clients to optimize data processing, analysis, and automation workflows, leading to more efficient script execution and reduced processing times.

Machine Learning Intern | Inmovidu *May 2020 - June 2020*

Conducted an in-depth analysis of Titanic survivor data using Exploratory Data Analysis (EDA), identifying Random Forest as the most effective algorithm for classification with minimal false discovery.

Projects

Research Paper Analysis System with RAG Architecture and MLOps **Oct 2024 - Dec 2024**

- Architected an end-to-end Research Paper Analysis System using RAG and LLMs, processing paper's abstract with FAISS and Flan-T5, achieving sub-second query responses.
- Implemented a production-grade MLOps pipeline with FastAPI microservices, Docker containerization, and deployment on Google Cloud Vertex AI, ensuring scalable and efficient processing.
- Developed automated CI/CD workflows with GitHub Actions, utilizing GCP service accounts for seamless integration and deployment, and built a responsive Gradio UI for real-time paper analysis and queries.

Real-Time Customer Support Chatbot | *LLM, NLP, CI/CD, AWS SageMaker, MLflow* **Oct 2024 - Nov 2024**

- Built and fine-tuned a Large Language Model Chatbot for customer support, delivering accurate real-time responses for diverse customer queries while tracking experiments and metrics using MLflow.
- Implemented CI/CD pipelines for AWS SageMaker deployment, enabling scalable production environments with robust version control and continuous model improvements.

Image Captioning with Vision Transformer and GPT-2 | *AWS,ViT, NLP, CI/CD* **Aug 2024 - Oct 2024**

- Developed an image captioning model combining Vision Transformer and GPT-2, integrating visual feature extraction with natural language processing to generate accurate and contextually relevant image captions.
- Integrated CI/CD pipelines for automated deployment on AWS and Hugging Face, ensuring scalability and reliability while enabling real-time caption generation and version control.

High-Fidelity 3D Scene Reconstruction Using NeRF | *Machine Learning , Computer Vision* **Mar 2024 - Apr 2024**

- Implemented a neural radiance fields (NeRF) model to reconstruct photorealistic 3D scenes from 2D images, enhancing rendering accuracy and depth perception using PyTorch.

Indoor Robot Navigation | *Motion Planning , Computer Vision , Perception* **Sep 2023 - Dec 2023**

- Assessed traditional algorithms like RRT and RRT* alongside reinforcement learning-based end-to-end action strategies for indoor robot navigation in habitat environments.

Self Driving Car | *Deep Learning, Computer Vision* **Jan 2021 - May 2021**

- Developed and deployed a custom object detection model on a Raspberry Pi 4, enabling real-time detection of traffic signs, pedestrians, and obstacles with 94% accuracy.
- Integrated the model into a miniature vehicle for autonomous navigation in a controlled environment.

Voice Comparer | *Deep Learning Neural Networks , Kivy , Tensorflow , SQL* **Dec 2019 - Mar 2020**

- Using a dataset for voice analysis and designed a user interface software using the Kivy framework and inferred model using Neural Networks to compare voice recordings, and achieved a 91% accuracy rate.

Technical Skills

Languages: Python, C++, Java, C, SQL
Developer Tools: VS Code, Android Studio, Firebase, MySQL, Git, Blender
Technologies/Frameworks: Tensorflow, PyTorch, Hugging Face, Linux, OpenCV, CI/CD , GCP, VertexAI, Docker, AWS, LangChain.

Certifications/Courses

Coursera: Neural Networks and Deep Learning by Andrew Ng, Deep Learning Specialisation.

Microsoft: End-to-end machine learning operations (MLOps) with Azure Machine Learning.