Butchi Venkatesh Adari

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Education

Worcester Polytechnic Institute

 $Aug\ 2023$ - $May\ 2025$

Masters in Robotics Engineering - GPA: 3.8/4.0

(Expected)

Anil Neerukonda Institute of Technology and Sciences

July 2017 - May 2021

Bachelors in Computer Science and Engineering - GPA: 7.77/10

Experience

Graduate Researcher

 $Worcester,\ Massachusetts$

 $ELPIS\ LAB\ |\ Worcester\ Polytechnic\ Institute$

Aug 2023 - Present

- Optimized Apple's Depth-Pro model for monocular depth estimation, reducing error from 10 cm to 3-4 cm.
- Engineered a Grasp Transformer to predict grasp poses from RGB images and monocular depth, validated in PyBullet simulation for UR10 robot integration.

Machine Learning Engineer

Hyderabad, India

Tata Consultancy Services

July 2021 - June 2023

- Designed a Computer Vision Pipeline for real-time object search using Google Vertex AI, achieving 91% accuracy in object detection.
- Automated document processing by fine-tuning custom OCR models, improving text extraction accuracy from complex layouts by 25%.
- Streamlined data processing workflows for Proximus and Vodafone, reducing processing times by 30% through machine learning pipelines.

Machine Learning Intern

India

Inmovidu

June 2019 - Aug 2019

• Analyzed Titanic survivor data using Exploratory Data Analysis (EDA), identifying Random Forest as the optimal algorithm with minimal false discovery.

Projects

Research Paper Analysis System with RAG Architecture and MLOps

Oct 2024 - Dec 2024

- Built an end-to-end Research Paper Analysis System using RAG and LLMs, achieving sub-second query responses with FAISS and Flan-T5.
- Deployed a robust MLOps pipeline utilizing FastAPI, Docker, and Google Cloud Vertex AI; achieved an impressive average query response time of 1.3 seconds on CPU for high-volume data processing tasks.
- Automated CI/CD workflows with GitHub Actions and GCP service accounts, enabling seamless deployment.

Real-Time Customer Support Chatbot | LLM, NLP, CI/CD, AWS Sage-Maker, MLflow

Sep 2024 - Oct 2024

- \bullet Developed a Large Language Model Chatbot for customer support, delivering real-time responses with 95% accuracy.
- Established CI/CD pipelines for AWS SageMaker, enabling continuous model improvements and version control.

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

- Created an image captioning model combining Vision Transformer and GPT-2, generating captions with 90% contextual relevance.
- Automated deployment on AWS and Hugging Face using CI/CD pipelines, ensuring real-time caption generation.

High-Fidelity 3D Scene Reconstruction Using NeRF \mid Machine Learning, Computer Vision

Mar 2024 - Apr 2024

• Reconstructed photorealistic 3D scenes from 2D images using neural radiance fields (NeRF), improving rendering accuracy.

Tesla Vision | Deep Learning, Computer Vision

Feb 2024 - Mar 2024

- Designed a 3D visualization system inspired by Tesla's autonomous dashboard, integrating YOLO3D, CLR-ERNet, and ZoeDepth for vehicle detection and lane recognition.
- Simulated interactive 3D scenes in Blender, incorporating motion visualization and collision prediction.

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

• Evaluated traditional algorithms (RRT, RRT*) and reinforcement learning strategies for indoor robot navigation in habitat environments.

Self-Driving Car | Deep Learning, Computer Vision

Jan 2021 - May 2021

- Customized a detection model for Raspberry Pi 4, enabling real-time identification of traffic signs and pedestrians with 94% accuracy.
- Integrated the model into a miniature vehicle for autonomous navigation in controlled environments.

Technical Skills

ML/DL Frameworks: PyTorch, TensorFlow, Hugging Face, Scikit-learn, LangChain, OpenCV

Languages/Programming: Python, C++, Java, C, SQL

Infrastructure: Docker, Kubernetes, MLflow, DVC, Git, Github, Version Control, Prometheus

Cloud Platforms: AWS SageMaker, GCP Vertex AI, Azure ML

Developer Tools: VS Code, Android Studio, Firebase, MySQL, Blender, Linux, Gradio, FastAPI, ROS Communication: Technical Documentation, Cross-functional Collaboration, Technical Presentations

Certifications/Courses

IIT Guwahati: PG Certification of AI & ML

Coursera: Neural Networks and Deep Learning by Andrew Ng, Deep Learning Specialisation. Microsoft: End-to-end machine learning operations (MLOps) with Azure Machine Learning.