

# Butchi Venkatesh Adari

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## Education

### Worcester Polytechnic Institute

Masters in Robotics Engineering - GPA: 3.8/4.0

Aug 2023 - May 2025

(Expected)

### Anil Neerukonda Institute of Technology and Sciences

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

July 2017 - May 2021

## Experience

### Graduate Researcher

ELPIS LAB | Worcester Polytechnic Institute

Worcester, Massachusetts

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 in PyTorch to predict grasp poses from RGB images and monocular depth, validated in simulation for UR10 robot integration and developed pick and place pipelines. ( **Advisor:** Prof. Constantinos Chamzas)

### Machine Learning Engineer

Tata Consultancy Services

Hyderabad, India

July 2021 - June 2023

- Designed a computer vision pipeline using YOLOv5, OCR, and Vertex AI, integrating multi-camera feeds through Pub/Sub to achieve 91% detection accuracy. Added an LLM-powered query system to convert natural language queries into SQL for BigQuery insights.
- Automated document processing system with custom OCR models and BigQuery integration, reducing workflow processing time by 30% across multiple clients.

## Projects

### Research Paper Analysis System with RAG Architecture and MLOps

Oct 2024 - Dec 2024

- Built a Research Paper Analysis System using RAG and achieving sub-second query responses with FAISS and Flan-T5.
- Deployed MLOps pipeline using FastAPI, Docker, CI/CD and Google Cloud Vertex AI; achieved average query response time of 1.3 seconds on CPU for high-volume data processing tasks.

### Real-Time Customer Support Chatbot | LLM, NLP, CI/CD, AWS SageMaker

Aug 2024 - Sep 2024

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

### Image Captioning with Vision Transformer and GPT-2 | ViT, NLP

May 2024 - Jun 2024

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

### High-Fidelity 3D Scene Reconstruction Using NeRF | Computer Vision

Mar 2024 - Apr 2024

- Reconstructed photorealistic 3D scenes from 2D images using neural radiance fields, improving rendering accuracy.
- Implemented novel view synthesis to generate multiple perspectives of 3D objects, enabling synthetic data generation.

### Tesla Vision | Deep Learning, Computer Vision

Jan 2024 - Feb 2024

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

### Indoor Robot Navigation | Motion Planning, Perception

Sep 2023 - Dec 2023

- Evaluated traditional algorithms (RRT, RRT\*) and RL strategies for indoor robot navigation in habitat environments.

## Technical Skills

**Frameworks:** PyTorch, TensorFlow, Hugging Face, Scikit-learn, LangChain, OpenCV, FastAPI

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

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

**Platforms:** AWS SageMaker, GCP Vertex AI, Azure ML, Linux, VS Code, 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.