Vijay Chevireddi

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EDUCATION

Master of Engineering (Robotics) - *University of Maryland, College Park, MD* | **GPA: 3.77/4.0** Aug 2023 – Present
Bachelor of Engineering (Mechanical) - *Osmania University, India* | **GPA: 9.05/10.0** Aug 2018 – June 2022

RELEVANT COURSEWORK

Multimodal Foundation Models (**Transformers, RoPE, Flash Attention, Fine Tuning, MAMBA, GPT-1,2,3, Agentic AI, Vision Lang. Models, Variational Auto Encoder, Diffusion Models, Flow Matching, SWIN Transformer, RAG, CLIP, DINO, LLaVA**), Natural Language Processing (**Audio Signal Processing for ML, RLHF, PPO, DPO, AI Alignment, AI Distillation, BERT, ELMO**), Robot Learning (**Reinforcement Learning**), Perception for Autonomous Robots (**Computer Vision**), Planning for Autonomous Robots**,** Control Systems

SKILLS

Languages C/C++, Python, Bash, MATLAB
Tools PyTorch, TensorFlow, AWS, SageMaker, SQL, OpenAI Gym, MuJoCo, Langchain, Langgraph, Hugging Face, Docker, Scikit-learn, xgboost, NLTK, Stable-baselines3, ROS2, NumPy, Pandas, OpenCV, SciPy

WORK EXPERIENCE

Deep Learning Intern, **Fischell Department of Bioengineering** - *University of Maryland* June 2024 – Present

As part of a University of Maryland-led initiative to modernize oyster farming, I implemented YOLOv8 for dredger detection and later upgraded to RT-DETR, improving IoU by 6%. I am currently developing human pose detection for walking style classification using MMPose and CNN transformer.

Machine Learning Engineer, **Sai Vamsi Industries** - *Hyderabad, India* Aug 2022 – May 2023

I integrated a camera-based system leveraging the YOLO framework to detect visual anomalies in press tool machines. By combining vibration data with real-time image analysis, I enhanced defect detection by 5%.

Machine Learning Intern, **Sai Vamsi Industries** – *Hyderabad, India* May 2021 – Aug 2022

I developed a K-means-based anomaly detection system by capturing real-time vibration data using Arduino Uno, Bluetooth HC-05 modules, and Fluke 3561 FC Sensors. This approach reduced unplanned downtime by 25%.

PROJECTS

Adaptive Text-to-Command Translation for Robot Navigation Using T5-small Oct 2024 – Dec 2024

Fine-tuned a T5-Small transformer to translate natural language commands into structured navigation plans with perfect test accuracy, integrated Low-Rank Adaptation (LoRA) to reduce training parameters by 99.64% while retaining 98.5% accuracy, and implemented the resulting NLP model with ROS2 and Gazebo to validate autonomous navigation on a TurtleBot3. [GitHub Link]

Multimodal Alignment Model for LiDAR and Image Data Using Q-Former Nov 2024 – Dec 2024

Developed a LiDAR-RGB alignment model using pretrained ViT and PointNet++ encoders with a Q-Former on the KITTI dataset, achieving robust embedding alignment through dropout, regularization, and hyperparameter tuning. Additionally, I extended the model to predict both 2D and 3D bounding boxes, demonstrating its potential for scalable applications. [GitHub Link]

AI learns to Play MARIO Using Deep-Q Learning and SWIN Transformer March 2024 – May 2024

This project combines DQN with a SWIN Transformer to train Mario-playing AI agent, enabling efficient interpretation of complex visuals and achieving a 500-moving average reward of 2700 in just 1250 episodes—far outperforming a model without SWIN. [GitHub Link]

Advanced Vision Systems for Autonomous Navigation Using YOLOv5 and Homography Jan 2024 – May 2024

We applied homography for dynamic route planning. Optical flow and YOLOv5 were used to detect obstacles and their velocities in real time, enabling adaptive navigation. By leveraging projective geometry to locate vanishing points and horizon lines, the robot achieved over 80% successful navigation in new terrains. [GitHub Link]