ANUDEEP SAI GOTTAPU

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SUMMARY

Robotics Engineer specializing in developing and training deep neural networks for path generation and integrating ML policies into robotic systems for sim-to-real deployment. Experienced in collecting and processing training datasets, real-time inference evaluation, and testing in simulators (Isaac Sim, MuJoCo) and on physical robots. Skilled in Computer Vision, Mapping, Localization, SLAM, and Sensor Fusion, with hands-on expertise in ROS, LiDAR/cameras/radars, Python, C++, CUDA

EDUCATION

Arizona State University   August 2024 - May 2026

Master of Science, Robotics and Autonomous Systems   Tempe, AZ, USA

Thesis: Research under prof Nakul Gopalan about Vision Language Action Models to develop safety mechanisms in robot motion

Relevant Coursework: Applied machine learning, Reinforcement Learning Algorithms, Mechanics of Micro/Nano Systems (MEMS), Advanced System modelling and control of robots, Multi Robot Systems, Linear Algebra for Engineers

Sreenidhi Institute of Science and Technology   August 2016 - September 2020

Bachelor of Technology (B.Tech), Mechanical Engineering   Hyderabad, India

Relevant Coursework: Data Structures and C++, Automation and Robotics, Operating Systems

SKILLS

Robotics & Simulation tools: ROS, ROS2, MoveIt, MuJoCo, PyBullet, Isaac Gym, OpenGL; **Languages**: Python, C, C++, Java, MATLAB, SQL; **Frameworks**: PyTorch, TensorFlow, Scikit-learn, Keras; **Libraries**: Pandas, NumPy, JAX, Flax, Optax, Matplotlib, Gymnasium (OpenAI Gym), OpenCV; **Infra Tools**: CUDA, Git, Linux, Bash, Docker, Kubernetes, AirFlow, Terraform, Google Colab, Jupyter, GCP, AWS, REST APIs, CI/CD, W&B;

Control Systems: Model Predictive Control (MPC), PLCs, CAN; **Robot Perception**: LiDAR, Cameras, Radars, SLAM, Sensor Fusion;

AI / ML Techniques: RAG, RLHF, GRPO, SAC, PPO, LoRA, FSDP, Model Quantization, Agentic AI, Behavior cloning

PROFESSIONAL EXPERIENCE

Research Associate, Logos Robotics Lab, Arizona State University, Tempe   June 2025 - present

- Implemented Vision-Language Action (VLA) models using Python and PyTorch, testing policies on the Libero benchmark task to generate collision-free robot motion for manipulators
- Train and evaluate manipulation policies directly from pixel observations via camera pipelines and vision encoders within VLA frameworks, linking multimodal perception to low-latency control
- Piloted sim-to-real deployment of VLA-conditioned RL manipulation policies on a Franka Emika arm, with responsibility for safety interlocks, latency budgets, and on-hardware bring-up
- Gathered and prepared robot manipulator datasets by logging sensor and joint data via ROS/ROS2 and generating simulated datasets in MuJoCo, enabling imitation learning and policy testing
- Incorporating domain randomization (sensor noise, dynamics) and transfer metrics into ongoing VLA manipulation work to harden policies for real-world deployment on Franka
- Optimized diffusion and autoregressive model pipelines using CUDA and PyTorch by implementing mixed-precision training, efficient batching, and GPU memory management, reducing inference latency for robotic applications
- Worked within large open-source codebases (e.g., VLA/LLM stacks), added unit tests, debugged training loops, and refactored modules to improve reliability and readability
- Researched reinforcement learning and policy alignment techniques (PPO, SAC) to improve robot decision-making for object detection in multi-agent robot coordination
- Contributing experiments and ablations toward lab manuscripts targeting ICRA/CoRL on VLA-driven safe manipulation
- Participated in weekly discussions with lab members to improve foundational models and robot motion on zero shot tasks

Research Associate, Yang Lab, Arizona State University, Tempe   December 2024 – June 2025

- Developed algorithms for voxelization of 3D models in MATLAB and Python for a volumetric DMD based 3D printer
- Implemented sinogram generation pipelines for DMD input using Python and NumPy, improving optical control system
- Delivered a presentation on RLHF-based LiDAR data processing and policy alignment with DPO, to achieve efficient control

Junior Engineer, Research & Development, Aparna Craft Exteriors, Hyderabad   August 2022 - July 2024

- Researched and tested new façade fabrication techniques, using CAD software, quality measurement tools, to ensure compatibility with existing systems and successfully completing projects worth $2.8M
- Collaborated with procurement, inventory, design, and production teams to resolve client issues and tracking results in Excel and internal reporting tools, helping the organization retain clients and secure new projects worth approximately $360K

Design Engineer trainee, Aparna Craft Exteriors, Hyderabad   May 2022 - August 2022

- Verified designs for manufacturability and system compatibility using CAD and Orgadata software, generating accurate assembly/fabrication files for 30 façade projects nationwide
- Coordinated sales, quality and production teams using SAP and CAD tools to achieve the design requirements of the customer

PROJECT EXPERIENCE

LLM alignment via direct preference optimization(DPO)   February 2025 – April 2025

- Implemented preference-based policy alignment (SFT + DPO) on LLMs, improving alignment accuracy by 25.8% on Anthropic HH-RLHF dataset
- Optimized GPU training on A100: 22% faster training via AdamW, cosine LR scheduling, gradient accumulation, and checkpoint recovery, prepared for LoRA, FSDP, and model parallelism scaling

Diffusion Model Training Using Reinforcement Learning   May 2025 – June 2025

- Finetuned Stable Diffusion v1.5 using Denoising Diffusion Policy Optimization (DDPO) and LoRA across 100 epochs on an A100-80GB GPU, optimizing for reward-driven objectives such as image compressibility and aesthetic quality
- Built a low-latency CLI and batch image generator (≤4 s per image), organizing 1,000+ outputs into structured datasets