

PRANAV CHETAN

AI / ML Engineer • Robotics & Edge AI • Computer Vision • LLM Agents & RAG

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SUMMARY

AI/ML engineer and Computer Science graduate who builds and ships AI systems on real hardware — edge compute, mobile robots, and industrial robotic arms. Currently at L&T Technology Services building an edge voice/chat AI assistant for vehicle-mounted equipment, an autonomous LiDAR-guided inspection robot on NVIDIA Jetson, and a vision-guided UR5e defect-rejection cell, with a bias toward low-latency systems that run in the physical world.

TECHNICAL SKILLS

Languages: Python (primary), Java, C++, C, C#, SQL, JavaScript

AI / ML / LLMs: LLM agents & tool-use orchestration; RAG & RAG evaluation; vector databases (Milvus); OpenAI, Gemini, Claude, Llama, Qwen, Gemma; anomaly detection (EfficientAD); YOLOv8/YOLO11; VLMs (Qwen3-VL)

Frameworks & Edge AI: PyTorch, Hugging Face Transformers, TensorFlow, ONNX, OpenCV; int8 quantization & model optimization; embedded/ARM edge deployment; latency & memory profiling

Robotics & Simulation: ROS2 Humble, MoveIt 2, URDF/USD, Isaac Sim, Jetson Orin Nano (JetPack/CUDA), UR5e (RTDE/URScript), LiDAR SLAM (FAST-LIO2/Point-LIO), hand-eye calibration, IK/motion planning

Backend & Cloud: Python REST APIs (FastAPI); WebSockets; AWS (S3); Docker; embedded Linux; Git

EXPERIENCE

L&T Technology Services (LTTS) — AI/ML Engineer Intern

April 2026 – Present

AUTONOMOUS TRACKED INSPECTION ROBOT: LiDAR-Guided Mobile Robot on NVIDIA Jetson

- Built an autonomous tracked inspection robot end to end (hardware, embedded software, ML pipeline, teleoperation UI) on an NVIDIA Jetson Orin Nano 8GB with a Unitree L2 3D LiDAR and a pan-tilt CSI camera.
- Designed a five-state autonomy loop (SEARCH → CONFIRM → CAPTURE → INSPECT → RESUME) with LiDAR proximity gating and a three-model on-device pipeline (EfficientAD, YOLO, Qwen3-VL), keeping detectors resident and deferring the VLM to a post-patrol pass to fit 8GB unified memory.
- Wrote browser-based teleoperation streaming motor commands over WebSockets at 20 Hz with a heartbeat watchdog, and engineered a dual-rail power architecture to eliminate motor-induced brownouts.

VISION-GUIDED UR5e PICK-AND-PLACE: Automated Defect Rejection for a Food Manufacturing Client

- Architected a quality-control cell pairing a multi-stage AI inspection pipeline (EfficientAD → YOLO → Qwen3-VL) with a UR5e arm that removes defective items from a production conveyor, mapping YOLO pixel coordinates to robot-frame pick poses via hand-eye calibration.
- Authored a self-contained UR5e URDF from published kinematic specs, validated at 0.8497 m reach against the 0.850 m spec, and imported it to USD for physics validation in NVIDIA Isaac Sim.
- Chose classical IK and motion planning (MoveIt 2 / UR RTDE) over RL, documenting the trade-offs for client stakeholders; switched to vacuum suction to eliminate crush risk on deformable products.

DEERE ASSIST: Edge AI Voice & Chat Assistant for John Deere

- Developed and deployed a voice-first conversational AI assistant on the SiMa.ai Modalix DevKit (ARM edge platform), delivering real-time search and equipment guidance on vehicle-mounted hardware.
- Built an LLM agent with tool-use orchestration that parses structured action tokens from natural language and routes them to equipment REST APIs over HTTPS.
- Engineered a multi-stage RAG pipeline over a 700+ page corpus (sparse retrieval, Milvus dense search, rank fusion, cross-encoder reranking), grounding every answer in cited sources.
- Deployed int8-quantized LLM and vision models, a custom ONNX wake-word model, and SCRFD/ArcFace biometric authentication, with runtime model loading/unloading to stay within on-device memory limits.

PROJECTS

General Motors—Sponsored Project: Public Policy Analytics

2025

- Built a conversational AI over legislative data that let non-technical users query records in plain English with no SQL, cutting turnaround from hours to seconds, with every answer cited to specific bills, votes, and records.
- Designed the Medallion (Bronze/Silver/Gold) data architecture and Python pipelines (Pandas, Scikit-learn) with governance controls (access boundaries, audit logging, full lineage); presented results to GM stakeholders.

EDUCATION & CERTIFICATIONS

Wayne State University — B.S. in Computer Science

December 2025

Machine Learning Specialization — Stanford & DeepLearning.AI (2024) • Python for Data Science, AI & Development — IBM