Pradeep Gopi

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EXPERIENCE

Forschungszentrum Informatik (FZI) Karlsruhe, Germany
Research Assistant *July 2024 – Jun 2025*

- Designed a GDPR-compliant deep learning pipeline for Intelligent Transportation Systems (ITS), utilizing Latent Diffusion Models (LDMs) to achieve a 19% higher mAP in face anonymization compared to GAN-based methods.
- Implemented YOLOv8 for precise mask generation, successfully anonymizing 100% of 3,765 faces in the Cityscapes dataset while maintaining high semantic integrity for downstream tasks (99.76% IoU)
- Integrated ControlNet into the pipeline to replace external Web UI APIs, enabling context-aware inpainting for realistic synthetic data generation and enhancing spatial control.

HFU Wirtschaftsingenieurwesen Furtwangen, Germany
Research Assistant *Sept 2023 – Jan 2024*

- Engineered a high-precision feedback system by integrating optical sensors into an educational articulated arm robot, enabling sub-millimeter accuracy in movement control and position detection.
- Developed and optimized motion planning algorithms for an articulated arm robot, incorporating inverse kinematics and collision detection to enhance task efficiency and safety.
- Leveraged Arduino and Python for rapid prototyping of embedded systems, enhancing real-time sensor feedback and actuator control.

EDUCATION

Hochschule Furtwangen University, Deutschland *Oct 2022 – August 2025*
Master of Science (M.Sc.) in Smart System Grade: 2.6

R.M.K college of Engineering and Technology, India *Sept 2017 – May 2021*
Bachelor of Engineering (B.E) in Mechanical Engineering Grade: 2.1

PROJECTS

Master Thesis: Zero-Shot Anomaly Detection Using Foundation Models — Github

Designed a Zero-Shot Anomaly Detection system by integrating Vision-Language Models (CLIP, PaliGemma). Achieved 90.9% classification accuracy on FracAtlas using PaliGemma for Visual Question Answering (VQA). Demonstrated superior localization with CLIP (118% higher IoU than baseline). Fine-tuned RF-DETR for anomaly detection, achieving ~0.42 mAP@50 with a low inference latency of 8ms for real-time applicability.

Cohere: AI-Assisted Group Trip Planner — Cohere

Architected a full-stack group travel platform using Next.js, FastAPI, and Supabase. Integrated Google Gemini 1.5 Flash to generate personalized itineraries based on aggregated user preferences. Developed a Telegram Bot for interactive survey distribution and implemented a custom Ranked-Choice Voting algorithm to resolve group decision-making conflicts. Deployed a scalable architecture using Docker, Render, and Vercel with comprehensive monitoring via Grafana

LEADERSHIP & TEAM PROJECTS

Design Head – Whiplash Racing (ATV Vehicle Racing Team)

- Led the mechanical design and prototyping of an All-Terrain Vehicle (ATV) using SolidWorks and FEA, achieving a national rank of 11th among 300 participants in SAE BAJA competitions.
- Directed Design for Manufacturing (DFM) workflows for chassis fabrication and powertrain assembly, ensuring structural integrity and compliance with race safety standards.

SKILLS

Languages: Python, C++, SQL, Bash, JavaScript
AI & Computer Vision: PyTorch, TensorFlow, OpenCV, CLIP, PaliGemma, LDMs, BERT, DETR, ControlNet, Scikit-Learn
Robotics & Hardware: ROS, Kinova Kortex, Arduino, Sensor Fusion, SLAM, PID, Microcontrollers.
Cloud & MLOps: Docker, Kubernetes, GCP (Vertex AI, GKE), AWS (SageMaker), Jenkins, GitOps, TensorFlow Serving
Concepts: Computer Vision, Transformers and Foundational Models, Anomaly Detection, Model Evaluation, Generalization & Robustness, ML System Design & Deployment Pipelines, Zero-Shot Learning, RAG, CI/CD for ML Systems, Robotics Perception.
Spoken Languages: English (C1), German (B1), Tamil, Telugu