Vedant Chavan Computer Vision & AI Engineer

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📄 Available Immediately | Open to Relocation

Profile

Computer Vision & AI Engineer with expertise in **3D perception, sensor fusion, and spatial data processing** for robotics and autonomous systems. Experienced in **stereo vision, point-cloud reconstruction, and GPU-optimized model deployment** using PyTorch, CUDA, and ONNX. Passionate about developing **scalable, real-time AI** that bridges the physical and digital worlds.

Skills

3D Perception: Stereo Vision, Multi-Sensor Fusion, Triangulation, Calibration, 3D Reconstruction, Point Cloud Processing, SLAM

Deep Learning: 2D/3D Detection, Tracking, Segmentation, Anomaly Detection

Frameworks & Tools: PyTorch, TensorFlow, OpenCV, ONNX Runtime, CUDA, Unreal Engine 5, COLMAP, Open3D, Docker

Programming: Python (advanced), C++ (intermediate), Bash

Optimization & Deployment: TensorRT, Quantization, AWS, CI/CD (GitHub Actions)

Generative AI / LLMs: LangChain, FAISS, Streamlit, Hugging Face, Prompt Engineering

Experience

03/2024 – 11/2024
Lippstadt, Germany

Master's Thesis - Stereo Vision for Adaptive Headlight Systems
Hella GmbH & Co. KGaA (FORVIA HELLA)
- Developed a **lightweight stereo-depth CNN** for long-range perception; achieved **3% D1-all error** on KITTI.
- Generated **9000 synthetic stereo pairs** in Unreal Engine 5 simulating lighting and weather variations; fine-tuned with real data for robust generalization.
- Combined depth maps with YOLO for 3D localization and trajectory estimation in varying illumination.
- Reduced inference latency from **120 to 70 ms** with ONNX Runtime; containerized pipeline for reproducible deployment.

08/2023 – 02/2024
Lippstadt, Germany

AI Research Intern - Intelligent Perception (ADAS)
Hella GmbH & Co. KGaA (FORVIA HELLA)
- Enhanced YOLOv8 for nighttime scenes, boosting mAP by 30% through augmentation and hyperparameter tuning.
- Developed **stereo triangulation and calibration** for 3D localization and lane estimation.
- Created and benchmarked **multi-object tracking pipelines** (DeepSORT, feature matching, OpenCV) validated with laser ground truth.
- Assessed **DINO, SAM, and DETR** for foundation-model adaptation in automotive perception.
- Automated dataset workflows with **Docker**, enabling reproducible GPU training.

Selected Projects

06/2025 – 07/2025
3D Scene Reconstruction and Gaussian Splatting
- Reconstructed dense 3D scenes from **COLMAP** point clouds using **Gaussian Splatting** to generate photorealistic spatial data for digital twin workflows.
- Evaluated reprojection accuracy and spatial fidelity across multiple camera poses, ensuring high-quality, scalable real-time 3D visualizations.

05/2025 – 06/2025
Visual Anomaly Detection for PCB Inspection (OpenCV / PyTorch)
- Developed an **unsupervised** anomaly-detection model using **PaDiM** and Mahalanobis distance; achieved **99% pixel-level accuracy** on MVTec AD.
- Visualized defect maps and feature embeddings for explainable AI analysis.

02/2025 – 03/2025	**Cloud Vision Pipeline (AWS / FastAPI / ONNX)**

- Deployed a real-time segmentation microservice on **AWS (EC2/ECR)** using **FastAPI** and **Docker**.
- Reduced inference latency to under 30ms with ONNX Runtime and automated CI/CD workflows.

03/2025 – 04/2025	**Chatbot with Retrieval-Augmented Generation (RAG)**

Built a **retrieval-augmented chatbot** using FAISS & LangChain; deployed on Hugging Face Spaces with Streamlit UI for interactive Q&A.

10/2022 – 02/2023	**Vision-Guided Bin-Picking for Industrial Robotics**

- Developed a YOLO-based **6D pose-estimation** (detection and orientation) system for ABB robot pick-and-place tasks in dynamic environments.
- Trained on hybrid synthetic (Blender) and real datasets to reach **98% detection accuracy**.

Education

10/2021 – 01/2025 Rosenheim, Germany	**M.Eng. Engineering Sciences – Mechatronics** Technische Hochschule Rosenheim
09/2020 – 04/2021 Pune, India	**PG Diploma - Advanced Computing** Centre for Development of Advanced Computing (CDAC)
06/2015 – 09/2019 Vellore, India	**B.Tech - Mechanical Engineering** Vellore Institute of Technology

Certificates

- Oracle Cloud Infrastructure 2025 Certified Generative AI Professional
- Generative Deep Learning with TensorFlow (2025)
- Advanced Computer Vision with TensorFlow (2025)
- Stanford Machine Learning (2022)

Languages

English: C1 (fluent) | **German:** B1 (intermediate)