Darshan Bakilana Ramesh

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GitHub | Weimar, Germany (Ready to relocate)

ABOUT ME

Robotics & AI Engineer with expertise in ROS, Computer Vision, and Machine Learning. Experienced in building autonomous systems, LLM-based tools, and scalable DevOps pipelines. Passionate about applying AI to robotics for real-world problem solving.

SKILLS

Programming & Scripting: Python, Java, C++, MATLAB, Octave, Bash, SQL

Platforms & Environments: ROS, Raspberry Pi, Jetbrains IntelliJ IDEA, PowerShell, Github, Jupiter Notebook

DevOps & Tools: Ubuntu (Linux), Docker, Jenkins, Git, JIRA, Atlassian Confluence, Gradle, Shell Scripting, CI/CD

Modelling & Additional Tools: Catia, Unigraphics (NXCAD), Ansys, Fusion 360, AutoCAD, QGIS, Autodesk Inventor, Lightroom

WORK EXPERIENCE

07/2024 – 04/2025
Weimar, Germany

Master Thesis - Machine Learning & Data Engineering
Bauhaus university Weimar

Title: Extraction and Analysis of Dataset Constraints for Plausibility of Data.

- Designed and implemented a framework to extract, evaluate, and compare dataset constraints using both **human-defined rules** and **machine-learned models** (e.g., **Isolation Forest**).
- Analyzed classifier disagreement (**Decision Trees** vs. **Support Vector Machines**) to identify implausible data points and generate targeted test datasets.
- Developed algorithms to automatically synthesize plausible datasets that strictly satisfy extracted constraints using formal reasoning via **SMT solvers (Z3)**, improving constraint validation reliability.
- Used **Python** and **SMT-LIB** with libraries such as **NumPy**, **Pandas**, **Scikit-learn**, **PyTorch**, and **Matplotlib.** Developed and tested in **Jupyter Notebooks** and **Visual Studio Code** with integration of **MLDiff** for constraint validation.

08/2022 – 11/2022
Lindau, Germany

Software Developer
Continental AG

- Built **Python scripts** to process **.pcd files** from autonomous vehicle **LIDAR sensors** stored in **ROSBag (.bag)** logs. Cleaned/filtered **3D point clouds** with **NumPy**, enriched with metadata via **Pandas**, and exported to CSV for ML and analytics teams.
- Verified data quality using **Open3D**, ensuring noise removal did not discard critical information.
- Designed and deployed **CI/CD pipelines** with **Jenkins**, **Bash**, and **GitHub webhooks** on a **Linux HPC cluster (SLURM)**, automating build, test, and deployment, cutting integration time by **30%**.
- Automated rollback and failure alerts (email/Slack) and optimized HPC module loading for faster perception algorithm testing.
- Managed **GitHub** workflows, enforced code reviews, and wrote contribution guidelines.
- Created **Jira (JQL)** KPI dashboards tracking sprint velocity, bug counts, and build times. Integrated with **Confluence** for real-time stakeholder updates.

PROJECTS

Masters Project - Software Engineering for Trusted Autonomous Vehicles

- Designed and implemented a complete software framework for (small-scale or virtual) autonomous vehicles, integrating **lane detection** (image processing), **object detection** (Lidar), **object recognition**, **obstacle avoidance**, path planning, and manoeuvre execution.
- Developed modular **software architecture** with **ROS nodes** and interfaces, and applied **software quality assurance** through rigorous testing and simulation.

- Tech Stack: **Ubuntu 20.04**, **Python** (**OpenCV**, **NumPy**), **ROS** (Noetic), **Rviz**
- Hardware: **LEGO EV3**, **Raspberry Pi**, **RP LiDAR**
- GitHub: https://github.com/se-buw/setav/tree/master

LLM-Powered Support Assistant for Robotics Systems

- Built a domain-specific **chatbot** for answering technical questions on robotics (**ROS, sensors, SLAM**) using a **Retrieval-Augmented Generation (RAG)** approach with **PDF-based context retrieval** and **large language models**.
- Developed a modular **QA engine** leveraging **semantic search** and **vector embeddings** to retrieve domain-relevant content, integrated with a **web interface** for interactive queries.
- Tech Stack: **Python**, **LangChain**, **FAISS**, **Streamlit**, **Docker**
- GitHub: https://github.com/DarshanBakilanaRamesh/robotics_qa_bot

Bachelor Project - Design and fabrication of pesticide spraying robot

- Designed and developed an **automated pesticide spraying robot** using a **rocker-bogie** mechanism for terrain navigation. Analyzed robot mobility across uneven agricultural fields and optimized stability. Developed a control system for autonomous navigation and efficient spraying.
- Tech Stack: **C++**, **CATIA**, **ANSYS**, **Autodesk Inventor**
- Hardware: **Arduino Mega 328**, **L293D H-Bridge IC**

EDUCATION

10/2020 – 04/2025 Weimar, Germany
Digital Engineering, M.Sc.
Bauhaus university weimar
Field(s) of study: Computer Science and Engineering
Modules: Machine Learning, Algorithms and Data Structures, Object-oriented Programming, Software Engineering, Statistics, Photogrammetric Computer Vision, Image analysis and object recognitions, Advanced BIM, etc

09/2015 – 09/2019
Mechanical Engineering, B.E.
Dayananda Sagar College of Engineering

LANGUAGES

- **German** (**B2** – Professional working proficiency)
- **English** (**C1** – Advanced)
- **Kannada** (Mother tongue)

CERTIFICATES

- Java programming masterclass
- Python programming masterclass
- AI on Jetson Nano - NVIDIA
- Awarded ‘Best Innovative Project’

HOBBIES AND INTERESTS

- Photography
- Karting
- Cookery
- PC games