Sandeep
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Software Engineer

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Professional Profile

Software Engineer with hands-on experience in **backend development** and **applied machine learning**. Proficient in **Python** and **Java**, building API-driven systems and containerized applications. Integrated **LLM-based interaction via Ollama** and developed **RL** models using **PyTorch** and **ROS**.

Professional Experience

01/2025 – 01/2026 **Working Student, Software Developer & Tester**, *Fraunhofer IPA*, Stuttgart

- Architected modular **Python** components for safety-critical analysis software, improving maintainability and fault isolation.
- Automated safety-concept generation for three predefined solution variants, replacing manual configuration workflows.
- Developed **React** + **FastAPI** system with **WebSockets** and integrated **Ollama**-based LLM interaction for AI-guided robot demonstration.
- Implemented **pytest** integration tests in **GitLab CI**, enabling automated validation on every commit.

10/2024 – 03/2025 **Research Assistant (Hiwi)**, *University of Stuttgart*, Stuttgart

- Developed and integrated a **ROS**-based dispenser node for automated object feeding in a pick-and-place system.
- Implemented deterministic state-based control logic synchronizing conveyor motion, sensor feedback, and robotic grasping (stop-detect-pick-resume cycle).
- Supervised and evaluated real-time **Ada** automation experiments for 20+ students under safety and performance criteria.

07/2023 – 07/2024 **Working Student, Software Tester**, *BOSCH*, Feuerbach

- Developed HWUT-based unit tests for CLI tools performing file hashing, 3D point cloud transformations, and structured CSV data processing.
- Designed boundary and malformed-input test cases to ensure deterministic tool behavior.
- Built Docker-based reproducible test environments for consistent execution across systems.

12/2020 – 09/2022 **Analyst - Production Support**, *Birlasoft*, Bangalore, India

- Ensured **99.9% uptime** for mission-critical production jobs by administering **Control-M** workflows and monitoring **AWS**-based infrastructure.
- Diagnosed and resolved production incidents through log analysis, root cause investigation, and cross-team coordination.
- Maintained **SLA** adherence across international teams through proactive system monitoring and incident response.
- Optimized job scheduling and execution pipelines to reduce failure rates and operational overhead.

Technical Skills

Languages Python, Java, TypeScript, SQL

Backend FastAPI, Spring Boot, REST APIs, WebSockets, ROS

Frontend React, HTML, CSS

Machine Learning PyTorch, Deep Q-Networks (DQN), Reinforcement Learning

DevOps & Cloud Docker, GitLab CI, AWS, Linux (Bash), Kubernetes (Basic), Terraform (Basic)

Testing Pytest, Unit Testing, Integration Testing

Education

10/2022 – Present **M.Sc. Information Technology**, *University of Stuttgart*, Germany, **Grade: 1.5**

Master Thesis: *Dynamic Function Offloading in Connected Vehicles using Deep Q-Networks*

- Designed a custom simulation framework and implemented a **Deep Q-Network (DQN)** agent in **PyTorch** for adaptive edge/cloud task offloading.
- Engineered a multi-criteria reward function incorporating latency and energy metrics, and compared results with a Particle Swarm Optimization (PSO)-based offloading strategy.

Research Project: *Energy Profiling in Service-Oriented Robotics*

- Developed a **ROS service**-based energy measurement system with CSV logging and real-time visualization via **MQTT** and Home Assistant.

08/2016 – 09/2020 **B.Eng. Electronics and Communication**, *Dr Ambedkar Institute of Technology*, Bangalore, India, **CGPA: 8.55**

Other Projects

02/2021 – 04/2021 **Order Management System** | **Java, Spring Boot, MySQL, Docker**

- Developed a full-stack web application with secure login features and distinct roles for Admin (inventory management) and User (product ordering).
- Containerized the application using **Docker** and successfully deployed it live on Render, integrated with a remote **Aiven MySQL** cloud database for data persistence.

Languages

English C1 (Professional Proficiency)

German A2 (Basic Working Proficiency)

Kannada Native