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, HTML, CSS
Backend & APIs	FastAPI, React, Spring Boot, REST, WebSockets, ROS
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