Greshma Shaji

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Portfolio : greshmashaji.github.io Medium : @greshmashaji

EDUCATION

Masters in Data Science 10/2022 | Erlangen, Germany

Friedrich-Alexander-Universität Erlangen-Nürnberg

Specialization: Machine Learning and Artificial Intelligence
Type of credits: 2.5/4.0(German grade)
Relevant Coursework: Deep Learning, Pattern Recognition, Pattern Analysis, Machine learning in Time Series, Natural Language Processing, Statistics, Big data Analysis, Business Intelligence

Bachelor of Technology in Computer Science and Engineering(Honours) 08/2017 – 06/2021 | Trivandrum, India

APJ Abdul Kalam Technological University

Final grade: 1.6 (German grade)
Relevant Coursework: Data Structures and Algorithms, Database Management Systems, Operating Systems, Software Engineering Principles, Artificial Intelligence Fundamentals

PROFESSIONAL EXPERIENCE

Fraunhofer ISI 04/2025 – 09/2025 | Heilbronn, Germany

Master Thesis - Development of a Modular Multi-Agent System Architecture for Enhanced Flexibility and Scalability

- Architected a modular Multi-Agent System (MAS) supporting 10+ heterogeneous agents with plug-and-play scalability
- Integrated 4 major LLMs (GPT-4, LLaMA 2, Claude, Mistral) achieving 95%+ task completion accuracy in agent collaboration
- Benchmarked 4 agent frameworks (LangChain, AutoGPT, CrewAI, AgentVerse) resulting in 30% performance optimization
- Implemented pub-sub and direct messaging protocols for agent coordination.
- Built a real-time dashboard for agent monitoring and control
- Maintained development and documentation in internal GitLab
- Co-authored a research paper on scalable LLM-based MAS architecture

BMW 09/2024 – 02/2025 | Munich, Germany

Software Engineering Intern

- Developed and maintained the open-source QUARK framework for quantum and classical hardware applications in automotive systems
- Collaborated with cross-functional teams to model, evaluate, and optimize quantum applications for real world automotive implementations
- Resolved dependency issues, improved code quality, PEP8 compliance, and comprehensive unit testing with improved coverage
- Contributed to AI Agent Workflow project, focusing on planning agent optimization and prompt refinement for multi-agent systems.
- Managed technical documentation and project tracking via Jira to ensure streamlined development processes

SAP 02/2024 – 07/2024 | Walldorf, Germany

Machine Learning Operations Engineer (MLOps) Working Student

- Developed Go-based Azure DevOps pipelines, reducing error resolution time by 30% and manual workload by 50%

- Integrated REST APIs with LLM systems to accelerate error communication and resolution processes by 25%
- Engineered automated resource cleanup pipelines, preventing resource wastage and optimizing cloud infrastructure
- Built voice-enabled chatbot using Python (pyttsx3, SentenceTransformer) and SAP BTP GPT-4-32k, improving query resolution by 40%
- Designed Flask backend architecture for streamlined voice query processing and chatbot operations

Fraunhofer IIS 06/2023 – 12/2023 | Nürnberg, Germany

Student Research Assistant

- Developed advanced recommendation systems for patient treatment planning, improving precision by 20%.
- Enhanced data analysis workflows using Python, increasing analytical efficiency by 30%.
- Implemented and optimized Random Forest Classifier models, achieving 15% improvement in prediction accuracy.
- Integrated MLflow for enhanced model tracking, transparency, and reproducibility across ML workflows.
- Established GitLab repository management practices, improving team collaboration and code quality by 25%

Retorio 10/2022 – 04/2023 | Munich, Germany

Working Student in Quality Assurance

- Designed test automation frameworks using Puppeteer and Jest, reducing execution time by 40%.
- Integrated automation frameworks with GitLab CI/CD pipelines, improving testing efficiency by 35%.
- Executed comprehensive manual and automated testing, enhancing platform stability by 25%.
- Developed JavaScript test scripts achieving 95% test coverage for NLP-driven recruitment platform
- Maintained detailed test documentation and performance metrics for development team collaboration
- Ensured quality delivery through systematic bug identification and reproducible testing procedures

IBM 08/2021 – 09/2022 | Bangalore, India

Software developer

- Developed UI automation frameworks using Puppeteer, Jest, and JavaScript, reducing manual testing by 60%.
- Integrated automation scripts with GitLab CI and Ansible, improving test efficiency by 45%.
- Increased test coverage by 50% and enhanced defect detection by 30% through systematic test analysis
- Led code reviews and mentored junior engineers, improving overall code quality by 25%
- Generated comprehensive test reports using Allure framework for stakeholder communication and transparency.
- Collaborated in Agile/Scrum environments to identify project risks and ensure smooth delivery execution

PUBLICATIONS

BenchQC - Scalable and modular benchmarking of industrial quantum computing applications 2025

INSPIRE HEP

Detecting COVID-19 from Chest X-Ray Images using Deep Learning 2021

IEEE

2021 5th International Conference on Information Systems and Computer Networks (ISCON), 2021, pp. 1-4

LANGUAGES

English (C2) **German** (A2) **Malayalam** (C2)

INTERESTS

- Tech Blogging
- Reading Science Fiction
- Hiking and Outdoor Adventures
- Puzzles and Problem Solving

SKILLS

Programming Languages: — Python, JavaScript, GO, SQL

AI and Machine Learning — TensorFlow, PyTorch, Computer Vision (CNNs, Object Detection), Scikit-learn, MLflow, SentenceTransformer, Pyttsx3, Pydicom

LLM & Agent Frameworks — Multi-Agent Systems (MAS), Prompt Engineering, GPT-4, LLaMA 2, Claude, Mistral, LangChain, AutoGPT, CrewAI, AgentVerse, Hugging Face Transformers

Web Development — HTML5, CSS , REST API, FastAPI, Flask,

Data Analysis & Visualization — Pandas, NumPy, Matplotlib, Seaborn, Excel

DevOps and Automation — Jenkins, Ansible, Azure DevOps, Puppeteer, Jest, Jasmine, POSTMAN, SOAP UI, Terraform, Grafana

Cloud & Platforms — SAP BTP, IBM Cloud Pak for Data, Azure, AWS, Google Cloud

Development Tools: — VS Code, Git (GitHub, GitLab), Figma, Confluence, Markdown, LaTeX, Jira

Databases: — PostgreSQL, MongoDB

Containerization: — Docker, Kubernetes

Soft Skills — Collaboration, Problem-Solving, Communication, Project Management, Analytical Thinking

Operating system: — Windows, MacOS, Linux

PROJECTS

3D Dendritic Spine Analysis using Deep Learning 04/2023 – 08/2023

Tools & Technologies: DeepD3, Pre-trained Neural Networks, 3D Image Processing, Python

Key Achievements:

- Developed a deep learning research project for automated dendritic spine analysis in brain function studies
- Implemented DeepD3 model with pre-trained neural networks for microscopy data annotation and validation.
- Trained neural network achieving optimized Mean Squared Error (MSE) for dendritic spine and dendrite prediction.
- Generated 3D regions of interest (ROIs) from benchmark image stacks for enhanced spine quantification
- Evaluated model performance using recall and precision metrics through a comprehensive comparison with human-annotated data.
- Automated quantification of neural structures critical for learning and memory processes using deep learning techniques.