Shashi Prakash

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Experience

Professional Profile: A results-driven **AI Researcher and Data Engineer** with 4+ years of experience across **AI research, data engineering, and applied machine learning** in academia and industry. Specialized in **Retrieval-Augmented Generation (RAG)**, scalable data pipelines, and AI-powered conversational systems. Proven ability to design end-to-end solutions integrating **LLMs, cloud platforms, and data engineering best practices**. Experienced in privacy-aware systems, explainable AI, and interactive data visualization. Strong collaborator with a research-oriented and product-focused mindset.

AI Research Engineer
November 2025 – Present

ZELTASK — *Germany*

- Architecting and developing enterprise-grade **Retrieval-Augmented Generation (RAG)** systems enabling natural-language interaction with structured and unstructured organizational data.
- Designed and deployed a **WhatsApp-based AI Copilot** using Kapso Cloud API, enabling secure conversational access to assets, orders, inspections, and inventory systems.
- Built scalable document ingestion pipelines supporting PDF/text uploads, implementing parsing, semantic chunking, embedding generation (BGE models), and vector indexing for high-accuracy retrieval.
- Integrated LLM-driven response generation with context-aware retrieval to reduce hallucinations, improve factual grounding, and support source-traceable enterprise answers.
- Engineered backend integrations with **Payload CMS APIs**, implementing authenticated workflows, multi-tenant support, and automated dataset generation for system validation and evaluation.
- Developed structured logging, conversation tracing, and evaluation frameworks to measure response accuracy, retrieval quality, and workflow correctness across 200+ enterprise query scenarios.
- Led system design improvements for performance, reliability, and production readiness, including rate-limit handling, webhook validation, and crash-safe data seeding strategies.

Student Research Assistant
January 2024 – January 2025

Secure Software Engineering Group, University of Paderborn — *Paderborn, Germany*

- Developed a web-based extension of a command-line tool to identify and label privacy-related data collected by Android apps, supporting developers with DSS compliance.
- Conducted user surveys with Android developers and integrated feedback to improve usability and feature prioritization.
- Implemented interactive dashboards using Flask, Vanilla JavaScript, and D3.js for real-time visualization of app data.
- Containerized the solution with Docker for reproducible and cross-platform deployment.

Extern
April 2022 – March 2023

Fraunhofer IEM, Paderborn, Germany — *Paderborn, Germany*

- Developed a virtual reality (VR) workstation simulation using C# and Unity to study ergonomic factors and optimize workplace configurations.
- Implemented Python scripts to collect, clean, and analyze sensor and observational data from VR experiments.
- Created interactive 3D visualizations to display ergonomic metrics and user posture data in real time.
- Collaborated with researchers to design experiments and interpret results for ergonomic improvement recommendations.

Research Project Member
April 2021 – December 2021

Data Science Group, University of Paderborn — *Paderborn, Germany*

- Worked on an Explainable AI project to migrate ontology management from Owlready2 to Neo4j for scalable graph-based reasoning and visualization.

- Developed data pipelines to import RDF/OWL ontologies into Neo4j using the Neosemantics (n10s) plugin.
- Implemented Cypher queries to extract and analyze semantic relationships in large knowledge graphs.
- Evaluated Neo4j for industrial use cases (e.g., fraud detection, personalization) compared to in-memory alternatives.

Associate Data Analytics BI August 2018 – February 2020
Qunito Technologies Pvt. Ltd, India *India*

- Designed and maintained Azure Data Factory pipelines to ingest, transform, and load data from SQL Server, flat files, and REST APIs into centralized data lakes.
- Created and optimized Python ETL scripts for automated cleansing, normalization, and aggregation workflows.
- Developed Power BI dashboards and reports to visualize KPIs and deliver actionable insights to stakeholders.
- Implemented data validation procedures and quality checks to ensure accuracy and integrity of processed datasets.
- Collaborated with cross-functional teams to gather reporting requirements and translate them into scalable BI solutions.

Education

MS in Computer Science Graduated August 2025
University of Paderborn *Paderborn, Germany*

BE in Computer Science and Engineering Graduated June 2018
Nitte Meenakshi Institute of Technology *Bangalore, India*

Master Thesis

Privacy Data Labelling Web Tool Supervisor: Prof. Dr. Eric Bodden
University of Paderborn *Paderborn, Germany*

- Developed a web-based tool using Flask and D3.js to help Android developers identify and label privacy-related data for Google Play DSS compliance.
- Implemented automated metadata extraction, JSON parsing, and interactive dashboards for real-time data visualization.
- Containerized the application using Docker and conducted usability studies to validate the tool.

Projects

Agentic Research Assistant | ***FastAPI, LangChain, ChromaDB, React, OpenAI/Groq API***

- Architected and developed a **multi-agent AI research assistant** capable of intelligent task routing between summarization, extraction, and comparison agents.
- Implemented a full **Retrieval-Augmented Generation (RAG)** pipeline including document ingestion, chunking, embedding generation, and semantic indexing using ChromaDB.
- Designed dynamic routing logic to select optimal agents based on query intent, improving response relevance and modular system extensibility.
- Built RESTful APIs using **FastAPI and Pydantic** for structured validation, agent orchestration, and scalable backend operations.
- Developed a responsive frontend with **React (TypeScript) and Vite** enabling interactive document querying and real-time research workflows.
- Integrated OpenAI/Groq APIs for high-performance inference while implementing retrieval grounding to reduce hallucinations and improve factual accuracy.

German Unemployment Analytics Pipeline | ***Python, PySpark, Pandas, SQL***

- Developed a PySpark ETL pipeline to ingest, clean, and transform multi-year unemployment datasets from the German Federal Employment Agency, enforcing schemas and generating partitioned Parquet outputs for efficient time-series analysis.
- Created analytics scripts and BI dashboards to visualize regional and seasonal employment trends.

Computational Argumentation | ***Python, NLTK, Word2Vec, BiLSTM***

- Developed an NLP system to classify text as claims, premises, or hate speech using NLTK PoS tags, Word2Vec embeddings, and a BiLSTM model.
- Collected training data using Scrapy-based web scraping and applied preprocessing for model readiness.

Smart Quality Monitoring – Kruse GmbH | ***Python, Pandas, Matplotlib, Time-Series Sensor Data***

- Designed a data analytics pipeline to identify faulty washing machine parts by integrating multi-source logs (ERP, MES, QMS) with high-frequency vibration sensor data.
- Merged and cleaned 1,500+ production and quality records using pandas; created binary quality labels for ML experimentation.
- Visualized 20kHz vibration signals from dual accelerometers and explored relationships between bearing faults and print defects.
- Built modular scripts for loading, preprocessing, and plotting time-series data with reusable folder structure and automated raw-file renaming.

Technical Skills

Programming Languages: Python, SQL, C#, JavaScript
AI & Machine Learning: TensorFlow, Keras, PyTorch, Scikit-learn, Hugging Face Transformers, LLMs, Prompt Engineering
NLP & RAG Systems: Retrieval-Augmented Generation (RAG), Text Embeddings, Semantic Search, Document Chunking, Vector Similarity Search
Data Engineering: ETL/ELT Design, Data Ingestion, Data Transformation, Data Mesh, Data Products, Microsoft Fabric, Azure Data Factory
Cloud Platforms: Microsoft Azure
Databases & Storage: PostgreSQL, MySQL, MongoDB, Snowflake, MS SQL Server, Power Query
Vector Databases: FAISS, ChromaDB
Infrastructure & DevOps: Docker, Kubernetes, Git, CI/CD, GitOps, Agile/Scrum
Data Processing & Analysis: Pandas, NumPy
Visualization & BI: Power BI, D3.js, Matplotlib
Web Technologies: Flask, REST APIs, HTML, CSS
Languages (Spoken): English (C1), German (B1)