VIJUL SHAH

Machine Learning Engineer | Full Stack Developer

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EDUCATION

Master in Computer Science Oct 2021 - Nov 2024

Rheinland-Pfälzische Technische Universität Kaiserslautern-Landau (RPTU) at Kaiserslautern, Germany.

- 1st Specialization in Intelligent Systems.
- 2nd Specialization in Data Visualization & Scientific Computing.

Bachelor of Computer Engineering Aug 2016 - Aug 2020

LDRP-ITR at Gandhinagar, India

WORK EXPERIENCE

ML Engineer, Fraunhofer IAIS Dec 2022 – current, at Sankt Augustin, Germany

- Developed a Deep Learning framework for experiment reproducibility.
- Developed Language Model for verifying German and English financial docs.
- Working on a project to detect sections in PDFs using Object Detection models and parse PDFs.
- Reference: Daniel Uedelhoven (daniel.uedelhoven@iais.fraunhofer.de)

Full Stack Developer, Bonds India Aug 2020 – Sept 2021, at Delhi, India

- Developed bonds trading platform from scratch, created secure pipelines for user registration, KYC, trading & payment, and more.
- Reference: Abhishek Birla [Tech Lead] (abhishek.birla@bondsindia.com)

Student Assistant, DFKI April 2022 - Aug 2022, at Kaiserslautern, Germany
(German Research Center for Artificial Intelligence)

- Worked on exploring and comparing the performance of various time-series databases like - TimescaleDB, Victoria Metrics, InfluxDB.

App Development Intern, Stackmaze Solutions Dec 2019 - Jun 2020, at Ahmedabad, India

- Worked on development, optimization, and bug fixing of various mobile apps.

SKILLS

- **Programming & Software Engineering:** Python, Javascript, Java, C, C++, React-JS, Node-JS, React-Native, Flask, AWS, Docker, SQL, Firebase, Github, Gitlab.
- **ML / DL / Data Analysis:** Pytorch, Numpy, Pandas, R, Matplotlib, Pytorch Lightning, Captum, torch-cam, Hugging Face, Accelerate, Tensorflow, MLFlow, Weights and Biases, SLURM.
- **Computer Vision & NLP:** Object Detection, Image Segmentation, Classification, Explainable AI, OpenCV, PEFT, Q-LoRA, Langchain, Streamlit.

CERTIFICATES

- Oracle Certified Professional, Java SE 6 Programmer — 6th Oct 2017
- Oracle Certified Expert, Java EE 6 Web Component Developer — 6th July 2018

LANGUAGES

- English: Professional Proficiency (C1 - IELTS)
- German: Elementary Proficiency (A2 - German Exam)
- Hindi: Professional Proficiency
- Gujarati: Mother Tongue

THESIS

Pupil Size Estimation with Super Resolution Mar 2024 - Nov 2024, at DFKI, Kaiserslautern

- Developing pipelines and models for pupil size detection along with Integrating super-resolution models for detection.
- Tasks: Data collection, Pre-processing, Super Resolution, Model Training. User surveys.
- https://github.com/vijulshah/webcam-based-pupil-diameter-estimation
- https://vijulshah.github.io/eyedentify
- Reference-1: Brian Moser [PhD Student] (brian.moser@dfki.de)
- Reference-2: Ko Watanabe [PhD Student] (ko.watanabe@dfki.de)

PROJECTS

Earth Observation with Explainable AI (XAI) at DFKI, Kaiserslautern

- Crop Classification and Segmentation through satellite fusion and Deep Neural Networks.
- Integrated Explainable AI for feature attribution analysis.
- Reference - Hiba Najjar [PhD Student] (hiba.najjar@dfki.de)

Fine-Tune LLM for Code Generation with Streamlit at RPTU, Kaiserslautern

- Fine-tune CodeLlama-7b-hf via Q-LoRA and PEFT.
- Synthetic dataset generation using meta.llama2-70b-chat-v1 by using prompting techniques.
- Created Streamlit App to prompt the model.
- https://github.com/vijulshah/ft_llm_code_generation

RESEARCH & PUBLICATIONS

ORCID: 0009-0008-5174-0793

- **Architectural Proposal for Reproducible, Standardized Deep Learning Research:** **Accepted** at IEEE International Conference on Software Architecture (ICSA 2025). https://github.com/mlgym/mlgym
- **EyeDentify:** A Dataset and first results for Pupil Diameter Estimation based on Webcam Images (Uploaded on Arxiv). https://arxiv.org/abs/2407.11204v1.
- **Webcam-based Pupil Diameter Prediction Benefits from Upscaling:** **Accepted** at International Conference on Agents and Artificial Intelligence (ICAART 2025). https://arxiv.org/abs/2408.10397.
- **PupilSense:** A Novel Application for Webcam-Based Pupil Diameter Estimation. **Submitted** at Eye Tracking Research & Applications (ETRA 2025). https://huggingface.co/spaces/vijulshah/pupilsense.
- **Automating Translation Checks of Financial Documents Using Large Language Models:** **Submitted** at Empirical Methods in Natural Language Processing (EMNLP 2024)