Ashlesha Ahirwadi

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Education

Northwestern University - Evanston, IL, USA Sept 2024 – Present

Masters of Science in Artificial Intelligence

- **Coursework:** Data Science, Artificial Intelligence, Machine Learning, Deep Learning, Human-Computer Interaction, Representation Reasoning and Learning, Azure by Microsoft

Cummins College Of Engineering For Women - Pune, India Sept 2020 – Jun 2024

Bachelors of Technology in Information Technology

- **Coursework:** Data Structure and Algorithm, Artificial Intelligence,Advanced Analytics Machine Learning, Natural Language Processing, Computer Vision, Soft Computing, Database Management System, Software Design and Development, DevOps, Information Security, Linear Algebra, Computer Architechture

Experience

AI/ML Engineering Intern, Imagit, Inc. – Chicago, IL Aug 2025 – Present

- Developing an insurance recommendation wizard to personalised policy suggestions based on structured intake data
- Implementing a Retrieval-Augmented Generation (RAG) system that leverages intake responses to support sales and marketing teams with contextual insights
- Applied LLM-based recommendation and retrieval techniques to improve lead engagement, streamline customer interactions, and enhance decision-making workflows

AI Engineering Intern, Arqaios Inc. – Chicago, IL Jun 2025 – Aug 2025

- Building an MVP for a smart electric fixture that uses mmWave sensors and AI to enable fall detection and human presence awareness
- Engineered real-time motion and activity detection algorithms using sensor features like range, azimuth, velocity, and confidence values
- Designed a hybrid edge-cloud pipeline for responsive inference and cloud-level diagnostics, ensuring scalability and low-latency alerts
- Focused on elderly care use cases by optimizing fall detection models and collaborating with hardware/software teams to align signal acquisition with smart home deployment standards

AI Research Intern, Symbiosis Centre For Medical Image Analysis – Pune, India Jul 2023 – Dec 2023

- Developed an innovative Statistical Shape Model to analyze and segment MRI scans of the femur bone demonstrating problem-solving skills and attention to detail to address complex medical imaging challenges.
- Acquired foundational knowledge through a MOOC on Shape Modelling from the University of Basel showing adaptability and a commitment to continuous learning.
- Built expertise in Scala and Image Processing and applied the Scalismo library for constructing the Statistical Shape Model.
- Gained deep insights into the cross-functional approach of medical imaging and data science.

AI Research Intern, Defence Research and Development Organisation(DRDO) – Pune,India Jul 2022 – Sep 2022

- Researched on spam email filtering using Machine Learning algorithms, gaining hands-on experience with data preprocessing and model training.
- Simulated various filtering algorithms using Orange, a data mining software, to improve the accuracy of spam detection to 99.4%, showcasing strong detail-oriented problem-solving skills.
- Compiled a comprehensive project report detailing the methodology and results of the spam filtering process, enhancing technical writing abilities while communicating complex information.

- Compiled reports ensuring clarity and compliance with technical documentation standards.

Research Papers

Sentiment Analysis Of Text documents Feb 2024

Isha Shetye, ***Ashlesha Ahirwadi***, Dr. Anagha Kulkarni

Literature Survey: Sentiment Analysis Of Text documents Nov 2023

Ashlesha Ahirwadi, Isha Shetye, Dr. Anagha Kulkarni

Projects

Lung Tumor Detection from 3D CT scans

Practicum Project |Northwestern Medicine – Abazeed Lab

- Developed a production-ready 3D tumor detection system using deep learning for radiation therapy planning from lung CT scans
- Engineered a multi-model ensemble (YOLO3D, UNETR, VNet) achieving 75.6% sensitivity and 69.6% AP@0.3 (VNet)
- Introduced Complete IoU (CIoU) loss and anisotropic anchor designs tailored for medical precision
- Accelerated training on H100 GPUs using mixed-precision, 16+ workers, and PyTorch Lightning with MONAI transforms

StoryTeller AI – Personalized Story Generator with Audio Narration

- Fine-tuned GPT-2 (HuggingFace) on r/WritingPrompts and fairy tale datasets to generate coherent 100–200 word stories from user prompts
- Built a Streamlit web app enabling real-time prompt input, story generation, and audio narration using a Text-to-Speech engine
- Enabled multimodal interaction with embedded playback and downloadable text/audio (.mp3) outputs
- Implemented full inference pipeline including input preprocessing, model decoding, and integrated TTS synthesis
- Demonstrated potential for AI in creative writing, edutainment, and accessibility applications

AI-Powered Image Restoration Pipeline

- Built an integrated pipeline to restore degraded images using denoising, super-resolution, and colorization stages
- Implemented a Denoising Autoencoder (DAE) to remove noise and scratches from historical and low-quality images
- Applied ESRGAN (Enhanced Super-Resolution GAN) to achieve 4× image upscaling with preserved fine detail
- Integrated DeOldify for grayscale image colorization using conditional GANs
- Developed an interactive Gradio-based web interface allowing real-time image restoration with user uploads
- Leveraged public datasets (DIV2K, ImageNet, NYPL) to train and test the unified restoration system

Amazon Fake Review Detection – NLP-Based Binary Classifier

- Built and evaluated multiple models to classify Amazon reviews as human-written or AI-generated
- Achieved 98.2% F1 Score with fine-tuned BERT-base, outperforming a TF-IDF + Logistic Regression baseline
- Fine-tuned Qwen2.5 (3B) using LoRA, achieving 98.6% accuracy, zero parse failures, and high precision/recall
- Delivered multimodal feedback (audio via Pygame + visual overlays) to enhance user engagement and correct posture
- Engineered content-based features and performed linguistic analysis to differentiate synthetic review patterns
- Demonstrated application of prompt tuning vs. full fine-tuning in a high-impact real-world classification task

Virtual Gym Trainer – Computer Vision-Based Fitness Feedback System

- Developed a real-time virtual workout assistant using MediaPipe pose estimation and OpenCV for upper-body posture tracking
- Computed joint angles via vector geometry and used a finite state machine to ensure accurate repetition counting across exercises
- Achieved >90% rep-counting accuracy with <0.2 sec latency under optimal conditions, validated against human-observed results
- Delivered multimodal feedback (audio via Pygame + visual overlays) to enhance user engagement and correct posture
- Designed the system to run on standard webcams with no specialised hardware, promoting accessibility for home fitness and rehabilitation use
- Proposed future enhancements including form correction models, mobile integration, and adaptive coaching via reinforcement learning

Local Business-Artist Connector App

- Led user research (interviews, surveys, testing) to identify pain points of 50+ local businesses/artists, informing a user-centered app prototype.
- Designed and prototyped AI-driven features (style/budget/location matching, in-app collaboration tools) using Figma, streamlining creative partnerships.
- Delivered a functional prototype praised for usability and scalability, presented to faculty and industry stakeholders.

GenAI Solution Development with Azure & RAG for Enterprise Workflows

- Developed a GenAI solution using Azure Machine Learning and RAG architecture for Contoso's operational workflows.
- Implemented agentic frameworks and prompt engineering pipelines to optimize model outputs.
- Deployed scalable cloud infrastructure on Azure (AKS, CI/CD pipelines), demonstrating expertise in GenAI Ops and enterprise-grade AI orchestration.

MediCurious - Specialized Medical LLM

- Developed a Large Language Model (LLM) to provide accurate and accessible medical insights for diverse audiences.
- Engineered AI-driven responses for real-world queries, including treatment recommendations, symptom analysis, and medication safety evaluations.
- Designed a scalable data pipeline integrating heterogeneous medical datasets into optimized JSONL formats, enabling efficient LLM training and powering a live demo for real-time, AI-augmented clinical decision support.

Artistic Visualization Of Dreams Using EEG

- Decoded dreams from EEG signals and reconstructed visual dream content using AI techniques.
- Processed and categorized EEG data, achieving 87.79% classification accuracy with a CNN model.
- Generated artistic visualizations using a visualization tool, translating EEG spectrograms into dynamic, theme-specific art.
- Designed an end-to-end pipeline integrating EEG preprocessing, CNN-based dream theme classification, and AI-driven artistic rendering to create a cohesive visualization system.

Stock Market Prediction (Options Trading - NASDAQ Dataset)

- Developed predictive models for options trading using NASDAQ 100 time series data from 2009 to 2024.
- Applied SARIMAX, LSTM, TiDE, and TS-Mixer models to forecast stock price trends and optimize trading strategies.
- Addressed data inconsistencies by resolving volume misrepresentations in the dataset, enhancing data quality and model accuracy.
- Providing insights through visualizations and reports that highlight predictive performance in different model architectures.

ICU Insight (Predictive Healthcare Analytics Project)

- Developed a predictive model for ICU patient admission using the MIMIC-IV database, analyzing clinical data from over 70,000 patients.
- Applied Random Forest and Neural Networks to classify ICU admissions, achieving Test AUC-ROC of 0.973 and 88% accuracy.
- Engineered features by calculating the ratio of abnormal lab results, leveraging temporal data to predict patient outcomes more effectively.
- Collaborated in a team of five to deliver insights, addressing data imbalance and proposing scalable solutions for future improvements.
- Engineered features leveraging temporal data, demonstrating expertise in machine learning and statistics.

Text Summarization and Synonym Generator

- Engineered a Natural Language Processing (NLP) system capable of summarizing large text documents and generating synonyms for words based on context, demonstrating strong problem-solving and collaboration skills within a team environment.
- Applied text preprocessing steps, including tokenization, stemming, lemmatization, and stop-word removal, utilizing NLTK and spaCy.
- Ensured detail-oriented implementation through rigorous testing and validation.
- Deployed the model as web application using Streamlit.

Technologies

Languages: Python, C, Java, Scala, SQL, JavaScript, HTML/CSS,

Technologies: PyTorch, TensorFlow, Keras, scikit-learn, NLTK/Spacy, Pandas, Numpy, Git, Docker, Pygame, Scalismo