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EDUCATION

Cochin University of Science & Technology

July 2021 – July 2026

M.Sc (5 year integrated) in Computer Science (Artificial Intelligence & Data Science)

TECHNICAL SKILLS

Programming: Python, C++, JavaScript, React

AI/LLM: Generative AI, PyTorch, TensorFlow, Scikit-Learn, Numpy, Pandas, Matplotlib

Backend: FastAPI, Node.js, MySQL

Methodologies: Agile, Scrum, SDLC

DevOps: AWS, Unix/Linux

Design: Figma, Rive, Photoshop, Canva

Core CS: Data Structures & Algorithms, Object-Oriented Programming

PROFESSIONAL EXPERIENCE

Research Intern | BITS Goa

April 2025 - April 2026

- Conducted in depth research in **Generative AI** and **Natural Language Processing**, focusing on efficient model adaptation and reliable text generation.
- Designed and executed **benchmarking studies** to evaluate large language models (LLMs) across multiple datasets, measuring accuracy, robustness, latency, and scalability.
- Implemented and analyzed **machine learning experiments** using **Python**, **PyTorch**, and **Hugging Face Transformers**, including fine-tuning, parameter-efficient training, and evaluation workflows.
- Explored **real-world applications** of generative AI in conversational systems and information retrieval, while identifying limitations and proposing improvements.

Front-End Developer Intern | Atria Power

May 2024 - June 2024

- Developed and maintained **front-end features** for Atria Power's internal and customer-facing platforms using **ReactJS** and **JavaScript**, ensuring clean, modular, and reusable code.
- Implemented **responsive and accessible UI/UX designs**, optimizing layouts for multiple screen sizes and devices to improve overall usability and customer engagement.
- Collaborated with backend developers to integrate **REST APIs**, ensuring smooth data flow and consistent functionality across services.
- Debugged and resolved a critical **OTP-based authentication issue**, improving the reliability of the login system and significantly enhancing user trust and experience.
- Optimized application performance by minimizing bundle size, improving load times, and applying best practices for **frontend performance tuning**.
- Contributed to the deployment pipeline and release processes, working with the engineering team to ensure stable and timely delivery of new features.

PROJECTS

Video Context Search

GitHub

- Built a natural-language video search system allowing users to query specific moments or scenes across videos and receive relevant video segments (with timestamps).
- Processed videos to extract frame-level embeddings using a text embedding model, indexed embeddings using **FAISS** for fast similarity searches.
- Stored and managed video metadata (video names, timestamps) for lookup using metadata files (pickle) to map search results to actual video segments.
- Exposed a REST API via **FastAPI** backend with a '/search' endpoint: accepts natural language queries, computes embedding, returns top-k relevant video frames / segments.
- Designed project for ease of setup locally: includes scripts for embedding generation, indexing, metadata creation; structured code into modules ('api', 'services', 'models', etc.) for maintainability.
- Potential applications include e-learning (search within lecture videos), video summarization, content management, and any domain where video retrieval by context matters.

Object Segmentation & Cropping: Human Privacy Protection

- Developed a system to automatically **detect humans in images** and selectively **blur faces and bodies** to protect identity while preserving the rest of the scene.
- Implemented **semantic segmentation models** to accurately identify humans in diverse poses and backgrounds, ensuring only relevant regions are blurred.

- Applied **image processing techniques** using **OpenCV** to perform precise cropping and selective blurring, avoiding unnecessary distortion of the background.
- Designed an **end-to-end pipeline** that takes any input image, detects people, applies privacy-preserving transformations, and outputs the processed image seamlessly.
- Optimized for **accuracy and efficiency**, making the tool suitable for privacy-conscious applications in public datasets, social media, and research.

Sentiment Analysis on Natural Language

GitHub

- Developed a **sentiment analysis system** trained on the **IMDb dataset** to classify movie reviews into positive or negative categories.
- Fine-tuned a **transformer-based model** from Hugging Face, applying advanced **transfer learning techniques** for high accuracy with minimal compute resources.
- Balanced **performance and efficiency** by leveraging pre-trained models with **accelerator support** (GPU/TPU), achieving faster inference without compromising accuracy.
- Implemented preprocessing, tokenization, and evaluation pipelines to ensure reproducibility and scalability of the solution.

NLP-Malayalam: Next-Word Prediction Model

- Built a **language model** for Malayalam capable of predicting the next word given partial sentences, addressing the challenge of low-resource Indic languages.
- Designed data preprocessing workflows including **text cleaning, tokenization, and embeddings** tailored for Malayalam script and grammar.
- Implemented and trained the model using **Python** and **PyTorch**, with experimentation in **Jupyter Notebooks** for iterative development.
- Evaluated model performance through perplexity and accuracy metrics, and refined workflows to improve prediction quality in real-world contexts.

Binance Crypto Market Dashboard

GitHub

- Designed and deployed a **real-time cryptocurrency analytics dashboard** for traders and analysts using **Python** and **Streamlit**.
- Integrated the **Binance API** to fetch live trading data and built auto-refreshing pipelines for top traded coins with **prediction labels and trend indicators**.
- Implemented **multi-currency conversion** (USD, INR, EUR, GBP, JPY) with API fallback mechanisms to maintain reliability during downtime.
- Added caching, **trendline visualizations**, and performance optimizations to ensure smooth user experience across deployments.
- The system provided real-time insights for decision-making and improved accessibility for non-technical users.

Color Contrast Checker

GitHub

- Developed a **React + TypeScript application** to evaluate text and background color combinations against **WCAG accessibility guidelines**.
- Implemented real-time color contrast checking with instant pass/fail feedback for **AA and AAA compliance levels**.
- Built a clean, responsive interface that adapts seamlessly across devices while prioritizing usability and accessibility.
- Enabled designers and developers to validate and enhance UI color schemes, ensuring inclusivity for users with visual impairments.

OPEN SOURCE CONTRIBUTIONS

Standard of Iron

Repo

- Contributed to the **Standard of Iron** project by improving Linux desktop launcher metadata.
- Enhanced `.desktop` integration by adding **GenericName, Categories, and Keywords** fields to improve desktop menu and search compatibility.
- Submitted and merged **PR #1094**, resolving **Issue #1086**.

BLOGS

1. Beyond the Canvas: Engineering an Infinite Collaborative Drawing Space
2. Building a Real-Time Binance Crypto Dashboard with Streamlit - Medium
3. Color Contrast Checker - Medium
4. SentimentSift: Unveiling Emotional Insights - Medium