Astha Rastogi

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SKILLS

Languages: Python, C, C++, JavaScript, MATLAB, SQL
Frameworks & Tools: PyTorch, TensorFlow, FastAPI, LangChain, AWS, Azure, ReactJS, Git

WORK EXPERIENCE

Machine Learning Engineer, ***GenAI Collective*** San Francisco, CA | Jan 2025 - May 2025

- Developed a matchmaking algorithm by engineering participant feature vectors from profile data and applying cosine similarity–based pairing, increasing one-on-one networking matches at AI networking events.
- **Cut down 60+ man-hours per week** by automating match validation using a self-improving algorithm with weighted embeddings and human-in-the-loop learning.

Machine Learning Engineer, ***Exponentia AI*** Mumbai, India | Oct 2023 - Jun 2024

- Developed **RAG-based** business analytics SaaS platform to streamline enterprise operations, improving document QA **reliability by 40%** through citation retrieval, enhancing trust and usability for business users.
- Facilitated multimodal retrieval and analysis of images, videos, and audio, integrating LLMs for contextual question-answering, which **reduced manual research time by 50%**.
- Engineered distributed systems infrastructure to scale document processing to **1M+ records** using **cloud-agnostic** modular architecture across AWS/Azure, reducing redundant development by **80%**.

Software Engineer - ML, ***Aalto University (Design AI)*** Helsinki, Finland | Jun 2022 - Sep 2023

- Architected software infrastructure for end-to-end Figma plugin stack using Python/React/SQL, automating brand compliance for enterprise clients (**H&M, KONE**) and reducing design review time by **70%**.
- Tackled redundant code and **shortened client onboarding cycles by 60%** by engineering a real-time CNN-powered model to detect and map company-specific UI components to global design kits.
- Addressed time-consuming manual review of brand guidelines by leveraging NLP and semantic similarity to match new requirements with existing implementations, **cutting developer review time by 75%**.

Machine Learning Researcher, ***University of Manchester*** Manchester, United Kingdom | Jun 2021 - Dec 2021

- Developed a **carbon emission calculation** model for recipes, enabling real-time sustainability analysis by evaluating cooking methods and ingredients to quantify carbon credits and promote eco-friendly choices.
- Created an event extraction system that structured unstructured data using **human-in-the-loop** training, through transformer-based models that asked clarifying questions and integrated POS tagging to **reduce misclassification errors.**
- Led cross-functional discussions to address technical blockers in the carbon emission model, leveraging technical communication skills to document and explain complex modeling decisions to researchers and domain experts.

RESEARCH PROJECTS

Quantitative Analysis of Instruction Specificity in Vision-Language Navigation

- Developed a metric to quantify instruction vagueness in VLNs and applied s**tatistical hypothesis testing** to evaluate SOTA models, finding a **5% accuracy gain** with specific prompts and uncovering generalization limits under vague instructions.

Optimizing Modality Usage in Visual Question Answering

- Implemented a multimodal architecture using a layer-residual mechanism to enhance cross-modal information flow in VQA, improving training stability and reasoning accuracy without added computational overhead.

ISIC 2024 - Skin Cancer Detection Challenge

- Built a multimodal skin cancer classifier by fusing EfficientNet image embeddings with engineered tabular features, applying a voting ensemble of LightGBM, XGBoost, and CatBoost with SMOTE and Stratified K-Fold CV to achieve 97% AUC.

EDUCATION

Boston University, *M.Sc. Machine Learning* Boston, MA | May 2025
GPA: 3.93/4.0
Coursework: Image & Video Computing, Machine Learning, Deep Learning, Data Science, Natural Language Processing

BITS Pilani, *B.Eng. Electronics & Instrumentation* Pilani, India | May 2022
Graduated First Division
Coursework: Data Structures & Algorithms, Object Oriented Programming, Linear Algebra, Discrete Mathematics