Aayan Mishra

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Summary

I'm a technically driven AI researcher and developer with hands-on experience building instruction-tuned language models, computer vision systems, and generative AI tools. I've led the development of **multiple open-source projects**, including **Athena** (an agentic instruction-following LLM) and OdysseyXL (an ultra-realistic SDXL finetune). My work spans **LLM training, fine-tuning, RLHF, model deployment**, and product integration — all backed by scalable infrastructure and rigorous experimentation. With a strong foundation in math, Python, and deep learning, I bring creative vision and practical engineering execution to every project.

Skills

Python • Deep Learning • C • Transformers • Stable Diffusion • AWS • Google Cloud Platform • Azure

Work Experience

Open-Source Developer & Researcher

Feb 2025 – present

Cohere Labs

Remote

Technologies: Python • Streamlit framework • Reinforcement Learning • Deep Learning

1. Multilingual Preference Reward Model (PRM) Research

- Collaborated on a research project exploring multilingual PRMS for reasoning and natural language generation tasks.
- Innovating on **step-wise reasoning verification** and adapting **RLHF techniques** (DPO, PPO, GRPO) for native language alignment.

2. Evaluation UI for Preference Modelling

- Designing and developing a **user interface for evaluating multilingual preferences**, enabling scalable comparison of model outputs **across different languages and reasoning chains.**

3. Vera-V1: Enhancing Multilingual Language Models with Group Relative Policy Optimisation (GRPO)

- Collaborated with students from **UC Berkley, University of Maryland and Indian Institute of Technology Jodhpur**, to work on a research project & paper with **Group Relative Policy Optimisation models in multilingual enviourments**

Projects

Large Language Model - Athena

Nov 2024 – present

1 coworker

Technologies: Python • Unsloth • Colab • Transformers • Peft

- Designed and fine-tuned a transformer-based instruction-following model focused on reasoning, alignment, and agentic behaviour.
- Implemented SFT, RLHF, and preference modelling to enhance performance on complex multi-step tasks.
- Built upon Alibaba's Qwen 2.5 and Deepseek AI's Deepseek R1 - Distils.
- Developed tools for evaluating alignment, controllability, and response consistency across use cases.

Diffusion Model - OdysseyXL

Nov 2024 – present

4 coworkers

Technologies: Stable Diffusion • Python • Cloud Computing Platforms • AI Image Generation

- Led the development of **OdysseyXL**, a family of **Stable Diffusion XL (SDXL)** finetunes focused on **ultra-realism**, prompt control, and stylistic versatility.
- Curated and processed high-quality datasets for human anatomy, environments, and material textures to enhance photorealistic generation.
- Applied advanced training techniques, including **LoRA and DreamBooth** to maintain style fidelity while improving generalisation.
- Released versions tailored for commercial and open-source use, balancing creative freedom with visual accuracy.

Education

High School Certification: N/A

Jan 2022 – Dec 2027 • 5 yrs 11 mos

Australian Christian College

Sydney, Australia

Illumination League Challenges – Participant

- Actively contributed to the **Illumination League Challenges**, a competitive series of STEM-related tasks designed to test creativity, problem-solving, and collaboration.
- Helped **ACC MP** secure **victories in 2 out of 5 challenges**, significantly contributing to the school's overall lead in the competition standings.
- Demonstrated strong teamwork, critical thinking, and perseverance across various challenge formats.

High School STEM Competition – Participant

- Competed in an inter-school **STEM competition** that brought together top students from multiple high schools.
- Engaged in hands-on problem-solving, applied scientific and mathematical concepts in real-world scenarios, and collaborated in team-based challenges.
- Gained valuable experience in time management, analytical reasoning, and presenting technical solutions under pressure.

Elective Coursework at ACC:

- **Hi-Tech**: Explored emerging technologies, digital systems, and practical applications of tech innovation in modern society. Coursework included the basics of coding, understanding digital infrastructure, and critical evaluation of tech trends.
- **Money Matters**: Developed financial literacy by learning about personal finance, budgeting, saving, investing, and the role of money in the economy. Focused on practical decision-making skills for future financial independence.

Certifications & Awards

Comprehensive Introduction to PyTorch - CodeSignal	Jan 2025
Python Developer - Sololearn	Dec 2024
Introduction to MCP - Hugging Face	Jun 2025
LLM Course - Hugging Face	May 2025
Introduction to Artificial Intelligence - TAFE NSW - Institute of Applied Technology	Jun 2025