AYUSH SHARMA

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EDUCATION [*Last semester is part time, so I am eligible to work part time from Sep-Dec 2024 & I am eligible to work full time in summer July-Sep 2024*]

Boston University (*M.S. in Artificial Intelligence***)** | *GPA: 3.67* | *September 2023 – December 2024* | **Boston, MA, USA**

- **Relevant Courses:** Graduate Level Directed Study (AI), Artificial Intelligence, Machine Learning, Deep Learning, Computer Vision, Data Science Tools and Applications, Metrics and Evaluation in Natural Language Processing.

Shri Mata Vaishno Devi University (*Bachelor of Technology in Computer Science***)** | *GPA: 8.43* | *August 2019 – May 2023* | **India**

PUBLICATIONS

Self-Improving Instructions and Programs for Visual Concept Learning using LLMs at a Human Level
Ayush Sharma, Yuke Zhang, Madeleine Udell, Iddo Drori, In progress

Solving Harvard's Mathematics PhD Quals and MIT's EECS Curriculum using LLMs at a Human Level
Iddo Drori, Danielle Drori, Cindy Zhang, Ryan Nie, Chunhao Bi, **Ayush Sharma**, Uday Garg, Shreyas Sudarsan, Seunghwan Hyun, Bargav Jagatha, Akshat Gurbaxani, Abhaya Shukla, Nicholas Belsten, Ori Kerret, Avi Shporer, Madeleine Udell, In progress

WORK EXPERIENCE

Schneider Electric **Bangalore, India**
Machine Learning and Data Science Intern | *Certificate* *January 2023 – July 2023*

- Implemented automation for cleaning and validating over **750,000** data points across more than **15** columns, achieving migration to multiple cloud platforms in under **10 seconds** through NumPy and Pandas in Python.
- Leveraged Bi-LSTM model, word embeddings (GloVe, BERT) to classify incoming customer complaint and request tickets.

JP Morgan **Remote**
Software Engineer Virtual Experience Intern | *Certificate* *July 2022 – August 2022*

- Analyzed stock data feeds with Python, NumPy, & Matplotlib, and created a data visualization web page in React.js.
- Enhanced stock price prediction accuracy from **0.785** to **0.838** by applying RNN and LSTM models on analyzed data.

The Sparks Foundation **Remote**
Web Developer Intern | *Certificate* *August 2021 – September 2021*

- Created a dynamic, responsive frontend for a banking website in JavaScript, utilizing React.JS, HTML/CSS, and Flexbox.

ACADEMIC EXPERIENCE AND PROJECTS

Graduate Student Researcher at Boston University | Advisor: *Prof. Iddo Drori* *November 2023 – Present*
Conducting research for research papers on advancing LLMs towards human-level IQ in Visual Reasoning and Mathematical tasks.

YouTube Assistant (End to End Deployed AI Application) *July 2024*
LangChain, Google Gemini 1.5 Flash LLM, MLOps, Sentence Transformer, FAISS, Gradio, Hugging Face | Website | Github Link

- An assistant that answers all queries about a YT video, saving users from watching the entire video just for a specific thing.
- Implemented LangChain and Gemini 1.5 model in the backend and used Meta's FAISS for document similarity search.
- Created the frontend (to input user query and video link, output result) using Gradio and deployed the site on Hugging Face.

Photo-realistic Video Generation using Diffusion Models (Research Project) *October 2023 – December 2023*
Text to Image Diffusion Models, DDIM and DPM Samplers, Image Generation | Research work paper link | Github Link

- Enhanced the state-of-the-art zero-shot text-guided video-to-video framework 'Rerender A Video' through dedicated research, focusing on Key Frame Sampling and Frame Selection.

Team Lead for Debt Collection project for B.U. client WGBH *January 2024 – May 2024*
Data Science and Analysis, SQL, Python, Pandas, Matplotlib | Detailed Results Link | Github Link

- Examined **5,000+** debt collection cases (from Massachusetts Court System Database) over 10 years for the client "WGBH", identifying a **20%** rise in debt case filings and a **25%** increase in virtual proceedings during pandemic (2020-2021), and other important insights like **40%** capias warrants, **30%** wage garnishments, top 10 debt collectors and companies, etc.

Image Generation using Generative Adversarial Networks – *Exploring Various Types of GANs* *April 2024*
Generative AI, Generative Adversarial Networks, BigGANs | Research Report link | Github Link

- Developed various models like basic **GAN** and **BigGAN** to generate dog images using the Stanford Dog Dataset. Used **Self Attention** and other architectural changes in these models to overcome issues like Mode Collapse, Artifacts problem, etc.

SKILLS

• Python • LangChain • OpenAI and Google Gemini API • MLOps • Generative AI • NumPy • Pandas • SQL • Matplotlib • Tensorflow • Keras • Scikit Learn • PyTorch • Java • C++ • Fine Tuning • Prompt Engineering and Techniques

CERTIFICATIONS and OTHER ACHIEVEMENTS

• LangChain (Certificate Link) • Stanford/Coursera Deep Learning Specialization (*Certificate Link*) • Finalist: Smart India Hackathon 2022 • Mentor- SMVDU AI Circle • Mentor- SMVDU Code Club • Silver medal, Swimming Regionals