AYUSH SHARMA

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EDUCATION

Boston University — Boston, MA, USA
Master of Science in Artificial Intelligence | GPA: 3.67 — Sept. 2023 – Dec. 2024*
- *Relevant Courses: Directed Study in AI, NLP, Metrics & Evaluation in NLP, Deep Learning, Computer Vision, Data Science*

Shri Mata Vaishno Devi University — Katra, India
Bachelor of Technology in Computer Science | GPA: 8.43 — Aug. 2019 – May 2023

EXPERIENCE

Graduate Teaching Assistant: Data Science Tools and Applications (CAS CS 506) — Sept. 2024 – Present
Boston University — *Boston, MA, USA*
- Teaching labs, designing labs, projects, and assignments for more than 200 students, and managing 5 graders for this course.

Machine Learning Intern — Jan. 2023 – July 2023
Schneider Electric | *Certificate link* — *Bengaluru, India*
- Worked for the Global Platform Housekeeping project by implementing 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.
- Improved the data migration time by 80% using optimized SQL queries, parallel computing using NumPy and Pandas.
- Leveraged Bi-LSTM model, word embeddings (GloVe, BERT) to classify incoming customer complaint and request tickets.

Software Engineer Intern — July 2022 – Aug. 2022
JP Morgan, Remote | *Certificate link* — *India*
- Analyzed stock data feeds with Python, NumPy, and Matplotlib, and created a data visualization web page in React.js.
- Enhanced stock price prediction accuracy from 78.5% to 83.8% by using variations of RNN/LSTM models on analyzed data.

Web Developer Intern — Aug. 2021 – Sept. 2021
The Sparks Foundation | *Certificate link* — *Katra, India*
- Created a dynamic, responsive frontend for a banking website in JavaScript, utilizing React.JS, HTML/CSS, and Flexbox.

RESEARCH WORK

As a Graduate Researcher at B.U. (Advisor: Prof. Iddo Drori), I am conducting following research in Artificial General Intelligence:
- **Solving the abstraction and reasoning corpus (ARC) at a human level**
  Mao Mao, **Ayush Sharma**, Yuke Zhang, Seunghwan Hyun, Madeleine Udell, Iddo Drori, In progress.
- **AI solves 2024 International Mathematical Olympiad at gold medal level**
  Iddo Drori, Ben Segev, Cindy Zhang, Ryan Nie, Chunhao Bi, **Ayush Sharma**, Uday Garg, Shreyas Sudarsan, Seunghwan Hyun, Mao Mao, Bargav Jagatha, Akshat G, Nicholas Belsten, Ori Kerret, Avi Shporer, Madeleine Udell, In progress.

PROJECTS

Research GPT | *Retrieval-Augmented Generation, LangChain, Google Gemini 1.5 Flash LLM, MLOps, Meta FAISS* | *Website link*
- Built an end-to-end deployed LLM app utilizing RAG, LangChain & Gemini 1.5 Flash in backend, FAISS for similarity search. Users can upload multiple documents or arXiv links and do research with accurate, context-aware responses.

Debt Collection Data Analysis – WGBH (BU client) (Team Lead) | *Data Science, SQL, Python, Pandas, Matplotlib* | *GitHub link*
- Examined 5,000+ debt cases from Massachusetts Court System Database over 10 years, uncovering 20% rise in cases, 25% more virtual proceedings during pandemic, 40% capias warrants, 30% wage garnishment, top 10 debt collectors.

Logical Reasoning Evaluation of LLMs | *Python, PyTorch, Hugging Face, T5, GPT-2, GPT-Neo, GPT-3.5* | *GitHub link*
- Designed a dataset (LogiSphere) consisting of 105 reasoning tasks to evaluate reasoning capabilities of LLMs like T5, GPT family, to conduct performance and error analysis, revealing model shortcomings such as pattern learning and hallucinations. Accuracy Results – GPT-3.5: 63%, GPT-Neo: 47%, GPT-2 XL: 24%, GPT-2 Large: 19%, GPT-2 Small: 10%.

Photo-realistic Video Generation | *Text to Image Diffusion Models, DDIM and DPM Samplers, PyTorch, Generative AI* | *GitHub link*
- Enhanced the SOTA zero-shot text-guided video-to-video framework 'Rerender A Video' through dedicated research, focusing on improving the Frame Sampling and Selection by replacing the original Sampler and Key frame sampling method.

TECHNICAL SKILLS AND ACHIEVEMENTS

- **Technical Skills**: LangChain, AutoGen, Multi-agent Systems, Generative AI, Transformers (BERT, GPT), Fine Tuning, Python, PyTorch, Tensorflow, Keras, Hugging Face, NumPy, Pandas, SQL, Matplotlib, Scikit-Learn, Java, C++, Git.
- **Certificates and Achievements**: LangChain (*Certificate link*), Stanford Deep Learning Specialization (*Certificate link*), Finalist: Smart India Hackathon 2022, Mentor: SMVDU AI Circle and Code Club, Silver medal: Swimming Regionals.