Shashwat Sharma

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Education

Institut Polytechnique de Paris — Sep 2024 – Sep 2026
Master in Computer Science - Data and Artificial Intelligence — *studying in M1*

Shri Mata Vaishno Devi University — Aug 2020 – Jul 2024
Bachelor of Technology in Computer Science and Engineering — *8.22/10 CGPA*

Indian Institute of Technology - Madras — Jan 2021 – Sep 2023
Diploma in Data Science — *8.16/10 CGPA*

Kothari International School
Grade XII CBSE- Physics, Chemistry, Mathematics, English, Economics — *91.6 %*
Grade X CBSE- Science, Social Science, Mathematics, English, German — *9.8/10 CGPA*

Research Experience

Laboratoire d'Informatique (LIX), École Polytechnique — Present
Exploring Machine Unlearning on Fine-Tuned LLMs — *Guide: Dr. Davide Buscaldi*

- Explored fine-tuning and machine unlearning concepts using a dataset of QnA pairs related to individual bibliographies. Fine-tuned a small LLM to achieve high performance and implemented machine unlearning to selectively remove 2% of the dataset while maintaining accuracy on the remaining pairs with minimal computational cost. Leveraged PEFT methods like LoRA and experimented with existing unlearning techniques to improve baseline methods.

Computing AI & DL Lab (Hecaidl), SMVD University — Undergraduate Research
Multilingual Speech Recognition and Summarization with Transformers — *Guide: Dr. Baijnath Kaushik*

- Designed a system for live transcription and summarization using transformer-based NLP models like BERT, RoBERTa, and sequence-to-sequence architectures. Fine-tuned pre-trained multilingual models, achieving an 8% reduction in word error rate for speech recognition tasks.

Advanced Transfer Learning and Medical Image Segmentation

- Conducted research on deep learning and transfer learning, leveraging pre-trained vision models such as VGG, ResNet, Inception, and U-Net architectures with backbones for image segmentation. Achieved state-of-the-art results in detecting various diseases by improving accuracy by 5–10% through feature selection through heuristic-based algorithms and advanced ensembling techniques.

Developing Multimodal Transformers for Medical VQA

- Developed a Multimodal Transformer for Medical VQA, integrating Transformer-based language models and MaxVit for image feature extraction. The architecture enhances medical image and text semantic representations through Masked Language Modeling with image features as a pretext task. Finetuned on the VQA-Med dataset, the model optimizes attention mechanisms for precise image region analysis, achieving state-of-the-art results with 83.1% modality accuracy.

Vision Transformer Compression using Structured Pruning Techniques — *Guide: Dr. Manoj Kumar Gupta*

- Implemented single-path one-shot neural architecture search to compress Vision Transformer (ViT) architectures, utilizing structured pruning techniques and fine-tuning for optimal performance. Achieved 35% reduction in parameters and FLOPs while maintaining accuracy, facilitating efficient deployment in mobile and edge devices.

Industrial Experience

Associate Data Scientist — Sep 2023 - Dec 2023
SkilloVilla — *Internship*

- Developed Jupyter Notebooks to enhance the data science curriculum, explicating diverse ML models, resulting in a 20% improvement in feedback scores compared to previous iterations. Collaborated with industry experts to design masterclasses for each topic, detailing real-world and industry-specific use cases for various models. Engineered an automated scoring system for Python lab test notebooks and ensuring efficient feedback mechanisms.

Patents & Publications

Intellectual Property, India — Published, 2024
Kaushik, B., **Sharma, S.**, Pant, P., Jamwal, R.
System and Method for Live Transcription and Summarization using Natural Language Processing

Intellectual Property Office, United Kingdom — Granted, 2023
Kaushik, B., **Sharma, S.**, Pant, P., Jamwal, R., Mahajan, A., Khan, Y., Ashok, M., Chadha, A.
A Novel Machine Learning Based Data-driven Device for Precision Agriculture

International Conference on Cognitive Computing and Cyber Physical Systems — *doi*
Sharma, S., Kaushik, B.
FeaTrim-ViT: ViT Trimming with One Shot Neural Architecture Search in Continuous Optimization Space

International Conference on Computing, Communication, Security and Intelligent Systems — *doi*
Gupta, N., Kaushik, B., Chadha, A., Khan, Y., **Sharma, S.**
An ensemble approach for multiclass skin lesion classification from dermoscopic images

Projects

Ensemble Language Models for Event Detection | *Natural Language Processing, HuggingFace Transformers*

- Developed a classification model using text features extracted via ensemble knowledge distillation from Language models ranging from word vectors to LLMs. Stacked the text and Temporal features with meta-classifiers. Designed a robust preprocessing pipeline and engineered features capturing semantic text insights.

Quantum Enhanced Transformer | *Pytorch, Transformer Networks*

- Developed Quantum-enhanced transformer model leveraging PennyLane for quantum computations, featuring quantum multi-head attention and feed-forward networks for improved information processing, attaining 7% higher text classification accuracy at the same number of training steps.

Voxtalum: AI Voice Assistant | *Langchain, DeepLake, Streamlit, Natural Language Processing*

- Developed a dual-input AI voice assistant using Whisper and Langchain, enabling efficient knowledge retrieval and natural user interactions. reated vector database using DeepLake for integrating the scraped knowledge base using BeautifulSoup4 and Implemented Streamlit app enabling easy user interactions.

Open Source Code Contributions | *Activeloop.ai, Plone, MindsDB, TensorFlow*

- Contributed in the QA of new datasets to *DeepLake* by implementing Pytorch dataloaders and models and Fixed open issues in Plone merged, TensorFlow merged and MindsDB merged.

Kaggle Competitions | *Python, PyTorch, TensorFlow*

- Achieved top 10% or better rankings in multiple Kaggle machine learning competitions, demonstrating skills in data preprocessing, feature engineering, and model optimization across diverse problem domains.

Technical Skills

Programming Languages: Python, C, C++, SQL
Data Science: TensorFlow, PyTorch, Pandas, NumPy, Matplotlib, Seaborn, Langchain
Software Development: Flask, FastAPI, Next.js, HTML/CSS
Development Tools: AWS (EC2, S3, Lambda), Kubernetes, MLflow, Tensorboard, Git, Docker
Languages: English (Fluent), German (B1), Hindi (Native), French (Learning)

Certifications

Amazon Science Machine Learning Summer School 2023
Activeloop.ai Train and Finetune Large Language Models in Production 2023
AWS Certification Amazon Web Services Academy Cloud Foundations 2022

Leadership

Google Developer Student Club | *Machine Learning Lead* 2022 – 2024

Led a team of 100+ developers as the Machine Learning Lead in Google Developer Student Club, conducted over 24+ workshops and contributed to open source projects that fostered practical AI and ML skills among members.

Volunteering

Vikalp | *Volunteer* 2021 – 2024

Volunteered at Vikalp, an organization dedicated to uplifting underprivileged children from rural areas surrounding the university, by providing educational support, fostering their holistic development, and organizing 40+ events, while also contributing to the development of Vikalp's website.

National Service Scheme | *Volunteer* 2021 – 2022

Served as a volunteer at the National Service Scheme, dedicating 120+ hours and leading impactful campaigns and community engagement initiative for increased computer literacy within rural areas.

Awards

Meritorious Scholarships

Received tuition fee scholarship at Shri Mata Vaishno Devi University on academic merit 2020
Received a 90% tuition fee scholarship at Fiitjee Institute based on high rank in National Entrance Exam 2017
Received a 50% tuition fee scholarship at Kothari International School based on high GPA in Grade 10th 2017

Scholarly Achievements

Qualified the Graduate Aptitude Test in Engineering (GATE) Achieved All India Rank 1331 (Top 2%) in Data Science 2024
Awarded Rank 1 in the Kimo.ai Artificial Intelligence Competition among all participants from IIT Madras 2023
Achieved 97th Percentile in Joint Entrance Examination out of 1.04 Million applicants across India 2020
Secured multiple medals in national science and mathematics olympiads during high school

International Award for Young People | *Duke of Edinburgh's International Award*

Attained the Silver Award for my outstanding contributions to various social outreach initiatives 2019

Extra Curricular Achievements

Awarded Volunteer of the session for my for my dedicated service at Vikalp 2022
First Place for Table Tennis Competitions at IIT Madras and SMVDU Katra 2022
Recipient of Best Speaker awards across multiple presentations and competitions