Curriculum Vitae

Shikhar Mishra

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Education

- **Chhatrapati Shahu Ji Maharaj University, Kanpur, UP**
  Bachelor of Science, Major in Mathematics & Minor in Artificial Intelligence
  CGPA: 9.16
  May 2021 – June 2024
- **Stepping Stones Intermediate College, Kanpur, UP**
  12th Intermediate
  CGPA: 8.47
  March 2020 – July 2021

Research Experience

- **Undergraduate ML Researcher**
  Department of Applied Mechanics, Motilal Nehru National Institute of Technology Prayagraj, India
  Jan 2024 – Present
  - Developed ML models for thermomechanical behavior prediction, reducing simulation time by 85% while improving accuracy to 95%.
  - Optimized data-driven neural networks (CNN, LSTM) for regression-based predictions, achieving a 30% accuracy improvement.
  - Handled noisy datasets through preprocessing, improving dataset usability and reducing processing time by 50%.
  - Authored a manuscript on machine learning approaches for predicting thermomechanical behavior of polymers.

Experience

- **Resident Researcher**
  Lossfunk, Bengaluru, KA
  Jan 2025 – Present
  - Explored research on Sparse Feature Circuits (SFCs) to enhance mechanistic interpretability of large language models (LLMs) such Gemma2 and GPT2-small.
  - Used SAE-lens and Neuronpedia to take advantage of tools like Gemmascope.
  - Collaborating with folks from the OSS community, Eleuther AI and lesswrong, to understand best practices in AI interpretability.
- **Open Source Contributor**
  Hugging Face Transformers & Unsloth.ai
  Present
  - **Hugging Face Transformers:**

    - Resolved critical Fully Sharded Data Parallel (FSDP) initialization issue, reducing training failures by 30%.
    - Collaborated with the community to improve the compatibility and performance of the distributed training system.
  - **Unsloth.ai:**
    - Implemented Mixtral (mixture of experts) support, expanding platform capabilities for advanced model architectures.
    - Enhanced platform's model support ecosystem, enabling efficient training and deployment of MoE models.

- **Machine Learning Research Intern**
  OrangeWood Labs (Y-Combinator W18), San Francisco, CA (Hybrid)
  June 2024 – Dec 2024
  - Designed memory-efficient transformers, reducing model size by 50% without performance loss.
  - Fine-tuned LLMs (RoboGPT) for task-specific interactions, achieving a 50% increase in success rate.
  - Deployed real-time AI pipelines, achieving latency below 200ms for conversational agents.

- **N&W Season 4 Builder**
  Buildspace (Y-Combinator W20 & a16z), San Francisco, CA (Remote)
  Sep 2023 – Oct 2023
  - Developed an AI algorithm for the prediction of heart disease, achieving 90% accuracy and 15% higher precision.
  - Leveraged XGBoost and Naive Bayes frameworks to improve model precision by 20%.
  - Collaborated with cross-functional teams to present a demo showcasing real-world applications.

Projects

- **transformer.p**
  PyTorch, NLP, Transformers
  March 2024 – May 2024
  - Developed custom transformer architectures, reducing processing time by 25% compared to standard models.
  - Implemented multi-head attention mechanisms and positional encodings for text classification.
  - Performance evaluated in the model on the IMDB and WMT datasets, achieving competitive results.

- **V-Transformer**
  Vision Transformers, Computer Vision
  Jan 2024 – Feb 2024
  - Developed Vision Transformers (ViTs) that achieved 95% accuracy on CIFAR-10, outperforming ResNet-50 by 5%.
  - Optimized attention mechanisms for image patches, reducing computational overhead by 20%.
  - Integrated custom pre-training techniques to enhance feature extraction and model generalization.
  - Showcased at Ready Tensor CV Projects Expo 2024 for innovative use of transformers.

Certifications & Achievements

- **Professional Certifications**
  - Machine Learning Zoomcamp (DataTalksClub) - Credential ID: 1EEC1A (Feb 2024)

  - Supervised Machine Learning: Regression and Classification (DeepLearning.AI) - Credential ID: ZDBYGSEKSKWX (Jan 2024)

- **Notable Achievements**
  - Successfully completed Google's Foobar Challenge (invite-only coding challenge by Google)
  - Awarded prestigious INSPIRE Scholarship, granted to top 1% of undergraduate science scholars in India
  - National Cadet Corps (NCC) B-Certificate holder, 59th Battalion Rajput Rifles, Kanpur Cantt

Technical Skills

- **Programming Languages:** Python, Go, SQL, Java, Scala
- **Machine Learning Frameworks:** PyTorch, TensorFlow, Transformers, XGBoost, scikit-learn
- **Machine Learning Domains:** Supervised Learning, Reinforcement Learning, Deep Learning
- **Specialized Techniques:** CNNs, NLP, Computer Vision, Risk Prediction Modeling
- **Cloud & DevOps:** AWS, Google Cloud, Docker, Kubernetes
- **Database Systems:** PostgreSQL, MySQL, SQL
- **Generative AI:** Stable Diffusion, Hugging Face Transformers
- **Tools:** Git, Apache Spark, Hadoop, Jupyter Notebooks

Professional Skills

- **Leadership & Management:** Project coordination, team leadership, Can do Approach
- **Communication:** Technical documentation, research presentation, cross-functional collaboration
- **Problem Solving:** Algorithmic thinking, systematic debugging, optimization strategies
- **Research:** Literature review, experimental design, data analysis, scientific writing
- **Military Discipline:** NCC training, team coordination, crisis management

Languages

- English: Professional Working Proficiency
- Hindi: Native Proficiency
- Japanese: Intermediate Proficiency (N4)