Rahul Singhal

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EDUCATION

New York University - Courant — **New York, USA**
Master of Science in Computer Science, GPA: 4.0/4.0 — *Sep 2023 - May 2025*

Jaypee Institute of Information Technology — **Delhi NCR, India**
B.Tech. (Hons.) in Computer Science and Engineering, GPA: 9.2/10 (First Division) — *Jul 2018 - Jun 2022*

WORK EXPERIENCE

NYU Courant - Parallel Computing — **Sep 2023 - Present**
Teaching Assistant (Advisor: Prof. Mohamed Zahran) — *New York, USA*

- Regular student facilitation for parallel computing course including CUDA, MPI, and OpenMP for GPU processing
- All round support offering in-depth assistance to 100+ students for mastering Linux/C++ programming

AXA XL — **Aug 2022 - Jul 2023**
Technology Analyst — *Delhi NCR, India*

- Put into practice Python, SQL, and VBA for financial modeling of the Actuarial Transformation Project (ATP)
- Developed 15+ visualization dashboards using Power BI & Tableau providing relevant performance indicators
- Achieved a notable 50% increase in throughput and ensured 95% reliability in forecasting outputs by deploying automated pipelines utilizing AWS Sagemaker and TensorFlow Extended (TFX) for scalability

AMTDC, Indian Institute of Technology (IIT) Madras — **Sep 2021 - Jul 2022**
Machine Learning Intern (Advisor: Vairamuthu Rajagopal) — *Chennai, India*

- Implemented Vision Transformers, GANs Graph CNNs for a QA system to address tool selection user queries in the heavy manufacturing industry while employing Docker and Kubernetes to support over 10k+ daily searches
- Constructed Graph Databases using Neo4j, interlinking diverse attributes and microservices hosted on AWS Cloud

Mitacs Globalink Research - Toronto Metropolitan University — **Jun 2021 - Jan 2022**
Machine Learning Intern (Advisor: Dr. Rasha Kashef) — *Toronto, Canada*

- Engineered a domain-agnostic weighted stacking ensemble model with sampling (WSEM-S) for efficient spam review detection across multiple E-commerce websites, mitigating the challenge of unbalanced class distribution
- This model, leveraging ensemble-based learning, n-gram modelling, and sampling techniques, exhibited accuracy surpassing previous benchmarks by over 16 %; Published paper and awarded 15000 CAD GRI fellowship

PROJECTS

- **Transformative Vision Architect:**: Made use of the Vision Transformer (ViT) architecture through PyTorch, achieving a significant improvement in regression accuracy of up to 10% compared to traditional convolutional approaches. Optimized Model Performance with Bayesian Hyperparameter Tuning leveraging Optuna and Hyperopt, resulting in a 15% enhancement in convergence rate and a 20% increase in inference speed, facilitating seamless deployment and operation in real-world applications.
- **Personalized Fashion Design E-Commerce Platform**: Developed a VAE-based model using generative AI capable of generating personalized fashion designs tailored to individual preferences. Increased customer engagement by over 20 % through the delivery of bespoke fashion designs, elevating the platform's competitive edge
- **Human Activity Recognition based on Deep Learning**: Trained deep neural networks for activity identification embedded devices in patients; implemented 3D Resnet & 3D CNNs using smartphone sensor signals [DOI]

TECHNICAL SKILLS

Programming Languages: Python, R, C++, Java, MATLAB, JavaScript, HDL, Bash Scripting
Machine Learning: PyTorch, PyTorch Lightning, Hugging Face, TensorFlow, Keras, GANs, VAE, HuggingFace
Data Processing: NumPy, SciPy, Pandas, Matplotlib, Scikit-Learn, spacy, Nltk, OpenCV
Large Language Models: GPT-4, LLaMA, Koala, MPT
Tools: AWS (Sagemaker, EC2), Azure ML Studio, Apache (Spark, Kafka), MLFlow, Streamlit

PUBLICATIONS

- Singhal, R., & Kashef, R. (2023). A Weighted Stacking Ensemble Model With Sampling for Fake Reviews Detection. *IEEE Transactions on Computational Social Systems, 1–17* [DOI]