Nikhil Kapila

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Summary

Skilled Machine Learning Practitioner with hands-on experience with Machine Learning and Deep Learning techniques coupled with experience in lighting and lighting control systems. Proven ability to design and deploy AI models, optimize ML pipelines, and implement smart control solutions.

Research Interests

I am passionate about optimizing and creating deep learning architectures. My interests extend to multimodal learning, exploring cross-modal similarities in image, text, and audio domains, and generative modeling using GANs and VAEs. I am also intrigued by inductive biases in neural networks and emerging approaches for AI in tabular data. My goal is to democratize AI by enabling efficient model deployment and fostering natural human-computer interaction.

Education

Georgia Institute of Technology Jan 2023 — Present
Master of Science in Computer Science - Artificial Intelligence (OMSCS Program) *Atlanta, GA*

- Current GPA: 4.00 / 4.00
- Completed Coursework: Deep Learning, Research Work, Machine Learning, Software Development Process, Knowledge-Based AI, Human-Computer Interaction
- Ongoing Coursework: Natural Language Processing, Big Data for Health (Spring 2025)
- Upcoming Coursework (Summer/Fall 2025): TBC
- `Unofficial` TA for Georgia Tech's Machine Learning class. Maintaining `mlrose-ky` library and documentation used in the class.

National Institute of Technology 2014 — 2018
Bachelors of Technology in Electronics and Communication Engineering *New Delhi, India*

- GPA: 6.97 / 10.00
- Excelled in CS-related course work: Data Structures, Algorithms, Object-Oriented Programming, Computer Networks, Image Processing

Employment History

Technical Engineer Jun 2018 — Present
Luxtron Systems *United Arab Emirates*

- Led the transition towards lighting and control systems from LED components which increased business value.
- Designing and installation of lighting control systems.
- Collaborated with cross-functional teams to deliver customized control solutions.
- Currently working on integrating AI features into our service offerings:
  - Trying to automate the commissioning process using Agents or similar.

Graduate Researcher May 2024 — Aug 2024
Georgia Institute of Technology *Remote (Atlanta, GA)*

- Graduate researcher, a part of the Human-Augmented Analytics Group.
- Implemented a full MLOps pipeline and researched whether LSTM models could be democratized on different building data. Published findings and models on HuggingFace Spaces and Github.

R&D Trainee Aug 2019 — Sept 2019
Helvar Oy Ab *Finland*

- Evaluated intelligent wireless nodes for lighting control systems.
- Created technical documentation for AC-DC converters in LED lighting.
- Presented market research findings for Middle Eastern lighting trends.

Research Intern 2017 — 2018
Indian Institute of Technology, Delhi *New Delhi, India*

- Developed simulations for quadrotor systems using MATLAB Simulink.
- Analyzed mechanical systems leading to quadrotor design optimizations.

Research Work (Pre Prints)

- Ongoing for Big Data for Health - Long Term Disease (ICD-9) Prediction using Unstructured Clinical Notes Github
- **Kapila, N.**, Glattki, J., & Rathi, T. (December 2024). "CNNtention: Can CNNs do better with Attention?" arXiv:2412.11657 [cs.CV]. Github
- **Kapila, N.** (July 2024). "Training LSTMs on Building Genome 2 Data." Github

Skills

Languages: Python, C, C++, MATLAB.

Frameworks: Experienced with PyTorch, ScikitLearn, NumPy/Numba, Pandas/Polars, Captum, Skorch, MLFlow.

Tools: HuggingFace, GitHub, Git VCS, DIALux, AutoCAD.

Research and Development: Academic Research, Lit Review, Market Review, Technical Documentation, Experiment Design, Data Pipeline Implementation.

Soft Skills: Collaboration in Cross-Functional Teams, Technical Communication, Problem-Solving, Project Management.

Coded Projects – Open Source Contributions & Masters Work

Deep Learning Projects (https://github.com/AttentionSeekers/CNNtention) Fall 2024

- Developed FCNNs, CNNs, generative models, RNNs, LSTMs, and Transformers using NumPy (from scratch) and PyTorch
- Designed and implemented the CNNtention project where we experimented with different types of attention layers in a deep ResNet.

LSTMs on BGD2 dataset (https://github.com/nkapila6/lstm-bgd2) Summer 2024

- Created a full end-to-end Machine Learning pipeline using PyTorch & Metaflow MLOps library during my research position.
- Deployed using Docker

Machine Learning Projects (https://nkapila.me/masters/cs7641-review) Spring 2024

- Implemented ML algorithms, including classification/regression, clustering, dimensionality reduction, and reinforcement learning agents. Wrote highly technical reports on each of these topics.
- Created a post on my technical blog detailing the adventures and learnings in this class.

Open Source Contributions

- **mlrose-ky**: Contributing to `mlrose`, a Python library used in Georgia Tech's CS7641 Machine Learning class. Wrote the full documentation and added new features.
- **Biscuit Code Editor**: Added a feature during my free time as a part of Hackoctober Fest 2024
- **Full List** of projects can be viewed on my GitHub

Certifications – Listing Recent 3 Only

- **Fundamentals of Deep Learning**, Nvidia (https://learn.nvidia.com/certificates?id=0x3zAbT6TfilxUwD_kMgaA) 2024
- **Machine Learning with Python**, IBM (https://www.credly.com/badges/88522d33-bcf6-4aca-ae8c-21a58a68a594/print) 2024
- **Machine Learning Foundations: A Case Study Approach**, University of Washington (https://www.coursera.org/account/accomplishments/verify/W6DPNVH4V88P) 2024
- **Full & Detailed List** can be viewed at my LinkedIn

References

Can be viewed on LinkedIn Others available on request