Akshay Raman

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Education

- **New York University, Courant Institute** — New York, United States
  Master of Science in Computer Science — *Sept. 2023 - May. 2025*
  - GPA: 4.0/4.0
  - Capstone Project: Single Task Continual Learning for Policy Gradient Methods. Report
- **Vellore Institute of Technology** — Vellore, India
  Bachelor of Technology in Computer Science and Engineering — *Jul. 2019 - Jul. 2023*
  - GPA: 9.28/10.00
  - Thesis: Neural Optimal Transport. Report

Technical Skills

Programming Languages: Python, C/C++, R, Java, SQL, LaTeX

Machine Learning Workflows: PyTorch, Tensorflow, scikit-learn, Gymnasium, HuggingFace

Tools and Libraries: NumPy, SciPy, OpenCV, OpenMP, MPI, CUDA, Git/GitHub, Linux

Research Experience

- **DICE Lab, New York University** *with Prof. Chinmay Hegde* — New York, United States
  Machine Learning Researcher — *Sept. 2024 - Present*
  - Pursuing research in multimodality and data-centric ML advised by Prof. Chinmay Hegde at NYU Tandon School of Engineering.
  - Currently focused on improving data curation strategies and benchmarking them on representation learning tasks.
- **AI4Science Group, University of Ottawa** *with Prof. Augusto Gerolin* — Ontario, Canada
  Mitacs Globalink Research Intern — *Jun. 2022 - Sept. 2022*
  - Worked on transportation theory and its applications in Density Functional Theory (DFT) under the guidance of Prof. Augusto Gerolin.
  - Developed deep learning methods that solve high-dimensional optimal transport to simulate the disassociation of atoms efficiently. Code
  - Conducted seminars to introduce machine learning fundamentals to students with non-technical backgrounds.

Publications

[1] Khan, R. et al. (including Raman, A.) **"Use of artificial intelligence algorithms to predict systemic diseases from retinal images"** - *WIREs Data Mining and Knowledge Discovery*, Vol. 13, No. 5 (2023)

Projects

1. **Hierarchical CLIP-based Image Geolocation Prediction** — Link
   - Trained a multimodal geolocation model using contrastive learning that predicts the precise location of an image taken anywhere on earth.
   - Designed a 100x more efficient inference technique that utilizes hierarchical feature clustering for efficient searching.

2. **Continual Learning with Policy Gradient Methods** Link
   - Designed novel incremental learning algorithms to train reinforcement learning agents on a variety of real-world environments (Ex. MuJoCo, Atari).
   - Modified policy gradient methods with eligibility traces to achieve efficient performance on long-horizon tasks.
3. **Multi-lingual Question Answering System** Link
   - Built a multi-lingual question answering system using the HuggingFace API on syntactic rules from multiple languages.
   - Finetuned BERT on the SQUAD dataset augmented with multiple question variants using back translation.

Teaching Experience

NYU CSCI-UA.0480 **Parallel Computing** *Grading Assistant* Fall 2023
NYU CSCI-GA.3033 **Multicore Processors** *Grading Assistant* Spring 2024
NYU CSCI-GA.3033 **Graphical Processing Units (GPUs)** *Grading Assistant* Fall 2024
NYU CSCI-UA.0202 **Operating Systems** *Course Assistant* Spring 2025