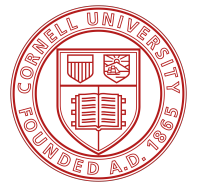


Madhav Aggarwal

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EDUCATION

CORNELL UNIVERSITY

MS COMPUTER SCIENCE

Expected: May, 2024 | Ithaca, USA

GPA: 4.0/4.3 | 13 student cohort

NATIONAL INSTITUTE OF TECHNOLOGY, TRICHY

BS (HON.) COMPUTER SCIENCE

Grad: May, 2022 | Trichy, India

Department Rank: 3/120

GPA: 9.52 / 10.0

COURSEWORK

UNDERGRADUATE (SELECT)

- Linear Algebra & Discrete Structures
- Database Management Systems
- Software Engineering & Compilers
- Data Communication & Networks
- Operating Systems
- AI & Expert Systems

GRADUATE

- Probabilistic and Generative Models
- Machine Learning (Advanced)
- Large Scale ML Systems
- Computer Vision
- Computer Graphics
- Information Networks
- Reinforcement Learning

TEACHING @ CORNELL

- FA22 & FA23 - CS 4620/5620:

Intro to **Computer Graphics**.

- SP23 - CS 4670/5670: Intro to

Computer Vision

- **Lectures:** Ray Tracing, Face

Tracking, Real-time Rendering.

- **Tools:** Unity, OpenGL, Pytorch

PROGRAMMING

LANGUAGES

- Python • C++ • TypeScript
- Java • Dart • JAX (Beginner)

MACHINE LEARNING

- PyTorch • Tensorflow • Pandas
- Scikit-Learn • Numpy • CUDA

TOOLS

- Blender • MongoDB • SpringBoot
- Redis • AWS S3, EC2 & Lambda

PATENTS & PUBLICATIONS

- [1] *Pocket Time-lapse - Temporal Gaussian Splatting*. ACM - SIGGRAPH, 2024.
- [2] Madhav Aggarwal. Large language model based intelligent malicious packet detection. (18384379), 2023. Status: Patent Pending.
- [3] *Transformer Based Motion In-Betweening*. Springer - ACCV Proceedings, 2023.
- [4] *Performance of Local Push Algorithms for Personalized PageRank on Multi-core Platforms*. IEEE - HiPC, 2022.
- [5] *Semi-Automatic Vehicle Detection System for Traffic Management*. Springer - ICA-IAA, 2022.

RESEARCH & EXPERIENCE

A10 NETWORKS | SENIOR RESEARCH INTERN

May' 2023 - Aug' 2023 | California, US

- Led the development of the **world's first DDoS attack mitigation tool** with optimized **K-Means clustering** using **Large-Language Models (LLMs)** and RAG.
- Improved the **accuracy** of a clustering-based wartime attack detection algorithm by **17.2%** on PCAP data using an **instruction fine-tuned** text embedding model.

USC VITERBI | IUSSTF RESEARCH FELLOW

Jun' 2021 - Oct' 2021 | Los Angeles, US

- Analysed the performance of **local push algorithms** in **Personalized PageRank (PPR)** using multi-core platforms with **Prof. Viktor Prasanna**.
- Demonstrated that **graph membership queries** consumed **>75%** of the total execution time, and developed a CUDA **acceleration** algorithm.
- **Novel Tech Used:** CUDA, Matlab, Profilers- AMD uProf & Intel VTune.

GOLDMAN SACHS | SUMMER FINANCIAL ANALYST

Jun' 2021 - Aug' 2021 | Bangalore, India

- Programmed indigenous **libraries** for **Decision Trees** and **Support Vector Machines** for explaining variance in client pricing achieving a test coverage **>95%**.
- **Novel Tech Used:** SpringBoot, GS Proprietary Languages: Slang, SecDB.

PROJECTS

HUNTR | LATENT SPACE CONTROL FOR STABLE DIFFUSION MODELS

- Developing a **Preference-based Bayesian Optimization** interactive tool with **Prof. Abe Davis** that accommodates user criteria using an efficient search of latent space.
- **Novel Tech Used:** ipywidgets, Pyopt (optimization)

GEOSAT | OPEN WORLD DAMAGE ASSESSMENT

- Establishing a semi-supervised **disaster damage assessment** benchmark for satellite images under the mentorship of **Prof. Bharath Hariharan**.
- Contrastively training a **visual-language model** to align with the image encoder of **OpenAI-CLIP** using paired internet and satellite images.
- **Novel Tech Used:** GDAL, QGIS

SSS | SIMPLE SEQUENCES OF SETS

- Developed a **Bidirectional Transformer** for **Next-Basket Recommendation** using segment encodings and **Sequences of Sets**.
- Under the mentorship of **Prof. K. Weinberger** beat **Graph ML** based set forecasting models with a **7.3%** improvement in **accuracy**.
- **Novel Tech Used:** Pytorch Geometric