

Education

Georgia Institute of Technology

Ph.D. in Algorithms, Combinatorics, and Optimization, GPA: 4.0/4.0

Anticipated Graduation: May 2023

Advisor: [Professor Santosh Vempala](#)

Key Courses: Machine Learning Theory, Combinatorial Optimization, Convex Optimization, Linear Programming

Atlanta, GA

2018- present

Indian Institute of Technology Bombay

Bachelor of Technology (with Honors), Computer Science and Engineering

Key Courses: Reinforcement Learning, Artificial Intelligence, Machine Learning, Game Theory

Mumbai, India

2013 - 2017

Research Interests

I am interested in Convex and Combinatorial optimization, Markov chain Monte Carlo algorithms, and Machine Learning theory

Publications

- He Jia, **Aditi Laddha**, Yin Tat Lee, Santosh S. Vempala. *Reducing Isotropy and Volume to KLS: An $O(n^3\psi^2)$ Volume Algorithm*, The 53rd Annual ACM SIGACT Symposium on Theory of Computing, STOC 2021.
- **Aditi Laddha** and Santosh S. Vempala. *Convergence of Gibbs Sampling: Coordinate Hit-and-Run Mixes Fast*, The 37th International Symposium on Computational Geometry, SoCG 2021.
Invited to **special issue** of Discrete & Computational Geometry
- **Aditi Laddha**, Yin Tat Lee, and Santosh Vempala. *Strong Self-Concordance and Sampling*, The 52nd Annual ACM SIGACT Symposium on Theory of Computing, STOC 2020.

Experience

Uber

June-Nov 2017

Software Engineer I

- Worked as a software development engineer in the Rider Access team at Uber Bangalore
- Designed the backend for a Call to Ride flow that targets non tech savvy demographic and provides equal access to all users

Microsoft

May-Jul 2016

Software Development Intern

- Used Microsoft's internal BigData analysis platform, Cosmos, for large scale data collection and classification
- Designed an interface to populate a non-relational database for easy data access and manipulation

Technische Universität Braunschweig

May-Aug 2015

Research Intern, Professor Sandor Fekete

- Worked on an online algorithm for triangulating the interior of a polygon by robots having a limited communication range
- Developed an algorithm for finding the lower envelope of a set of curves

Key Academic Projects

Learning Keywords via Matrix Factorization

- Trained a **semi-supervised** model to learn keywords from audio using Non-negative matrix factorization
- Achieved 85% accuracy for keyword detection in test dataset

Variational Autoencoder

- Implemented a variational autoencoder using **PyTorch** to learn the distribution of low dimensional latent space
- Used the VAE on single-cell gene expression dataset to produce 2D and 3D visualizations

Carrom - Game AI

- Implemented a Reinforcement Learning agent to play the game of Carrom
- Trained the agent using **Q-Learning** to determine the best action for position, angle, force

Modelling Dynamics of Natural Hair

- Modeled a strand of hair as a piece-wise helix to model straight, wavy or curly hair by adjusting the number of pieces in a strand
- Used the model to create an animation of the movement of a strand of hair under various forces like gravity, wind, etc

Technical Skills

- **Programming Languages:** Python, C/C++, R, Java, SQL
- **Data Analysis:** NumPy, MATLAB, PyTorch, TensorFlow

Awards and Fellowships

- Awarded the [2020 Microsoft Research Ada Lovelace Fellowship](#)
- Awarded the ARC-TRIAD Student Fellowship by Georgia Tech Algorithms and Randomness Center Spring 2020
- Awarded the Aditya Birla Scholarship for academic excellence by the Aditya Birla Foundation 2013-2017

Teaching

- Served as a Teaching Assistant for **Machine Learning Theory** and **Automata and Complexity** at Georgia Tech
- Designed and evaluated quizzes, exams & projects, and conducted office hours for a class of 50 students