

KRISHNA N AGARAM

[✉ kagaram2@illinois.edu](mailto:kagaram2@illinois.edu) [⌚ mathismusic](https://mathismusic.com) [🔗 mathismusic.github.io](https://mathismusic.github.io) [👤 Krishna Agaram](https://www.linkedin.com/in/knagaram/) **Citizenship:** USA

EDUCATION

University of Illinois Urbana-Champaign, MS (Thesis track), CS

Advisor: Prof. Saurabh Gupta

Urbana, IL

Aug. 2025 - May. 2027

Indian Institute of Technology Bombay, B.Tech (with Honors), CS

GPA: **9.86/10**, ranked **3/194** overall; minors in **machine intelligence** and **mathematics**

Mumbai, India

Nov. 2021 - May. 2025

- Selected coursework: RL, Robotics, Stat learning, Kernel methods, Formal methods for ML, Crypto, Adv. compilers, Discrete Math/Algo/Automata, Arch/Net/OS/DB/Compilers, Real/Complex/Fourier analysis, Linear/Abstract algebra

RESEARCH EXPERIENCE

Sim-to-real Robotic Manipulation | Guide: Prof. Saurabh Gupta

Aug. 2025 - present, UIUC

- Work on sim2real transfer for manipulation tasks focusing on policy generalization to novel tasks in **novel environments**
- Techniques unite ideas from abstract scene **representation**, model distillation & RL **exploration** with few demonstrations

Sycophancy in multi-agent systems | Guide: Prof. Dilek Hakkani-Tür

Aug. 2025 - present, UIUC

- Quantitative evaluation of sycophantic behavior of a hierarchy of **cooperative multi-agent** systems across various tasks
- Designing a pipeline to learn interaction weights between agents and reduce sycophantic behavior of the overall system

Towards proving the Neural Feature Ansatz | Guide: Prof. Parthe Pandit

Jun. 2025 - present, IIT Bombay

- Working to prove the **Deep Neural Feature Ansatz** for the cosine kernel; provably affords **fast neural feature learning**
- Proofs involve the use of neural tangent kernels, infinite matrix theory, some Fourier and functional analysis

Lower bounds on testing 3-colorability | Guide: Prof. Akash Kumar

Jan. 2024 - Apr. 2024, IIT Bombay

- Established **optimal** linear lower bound for one-sided 3-colorability testing on $(1/3 - \epsilon)$ -far vs colorable expander graphs
- Studied various **lower bound constructions** in an attempt to prove two-sided bound for ϵ -far vs colorable expanders

RESEARCH INTERNSHIPS

Quantum Positional Proof Systems [†] | Guide: Prof. Nick Spooner

Jun. 2024 - Sep. 2025, EPFL

- Formalized positional interactive proof systems; **characterized** complexity-theoretic expressivity in the classical setting
- Proved that quantum resources can improve expressivity using techniques from nonlocal games & **no-signaling theory**
- Solved the XOR-variant of the well-known **monogamy-of-entanglement** game; proved anti-parallel-repetition as corollary

RL for quantum state preparation [†] | Guide: Prof. Vikas Garg

Jun. 2023 - Sep. 2024, Aalto University

- Improved the quantum state preparation pipeline with an RL agent capable of constructing 9-qubit stabilizer states **zero-shot** ($\sim 4 \times 10^{16}$ states in total) while being **30%** more efficient than baselines; exploration solved via novel dense reward
- Proved that this efficiency holds for **at least 95%** of all states despite seeing **only 10⁻⁸%** of all states throughout training

ACADEMIC EXPERIENCE

Preparing arbitrary stabilizer states via disentangling and path-aware reinforcement learning [†]

Nov. 2025

K. Agaram, S. Midha, A. Müller and V. Garg. Accepted to **QIP 2025** and **ML4PS@NeurIPS 2025**

Quantum state preparation with reinforcement learning, oral [🔗] *at the APS Global Physics Summit 2025*

Mar. 2025

Invited to and participated in the Cornell-Maryland-Max Planck Pre-doctoral Research School, Saarbrücken

Aug. 2024

OTHER PROJECTS

Mobile Robot Localization [🔗] | Guide: Prof. Leena Vachhani

Oct. 2024 - Nov. 2024, **final project: Robotics**

- Wrote a ROS package for mobile robot navigation using MoCap+trilateration with Kalman filtering to offset sensor noise

Video Style Transfer [🔗] | Guide: Prof. Preethi Jyothi

Aug. 2023 - Nov. 2023, **final project: ML**

- Implemented style transfer for **videos**, preserving style of moving objects across frames via occlusion-aware optical flow

SCHOLASTIC ACHIEVEMENTS

Received the **Institute Academic Prize** given to the **top 1%** of students for stellar academic record

2022, 2024

Placed **1st, 2nd, 2nd** in India and **8th** (thrice) overall at the **Simon Marais Mathematics Competition**

2022, 2023, 2024

Secured All India Rank **40** in **JEE Advanced** and 122 in JEE Main among 140K+ and 1M+ aspirants respectively

2021

Among the **top 35** students (twice) invited to the **International Mathematics Olympiad Training Camp**

2020, 2021

Qualified for the International Olympiad on Astronomy and Astrophysics Team Selection Camp (IOAA OCSC)

2020

Conferred with the prestigious **KVPY** (All India Rank 23) and **NTSE** (ranked 2nd in Stage 1) scholarships

2019, 2020

TECHNICAL SKILLS

Languages | Python, C/C++, Java, x86 assembly, SQL, bash, MATLAB, Javascript, \LaTeX

Libraries | PyTorch, TensorFlow, NVIDIA IsaacGym, OpenAI Gym, NumPy, Pandas, et al., IBM Qiskit, Manim

[†] Preprints available upon request.