Krishna N Agaram

✉ kagaram2@illinois.edu   ⌂ mathismusic   🔗 mathismusic.github.io   🔗 Krishna Agaram   **Citizenship**: USA

EDUCATION

University of Illinois Urbana-Champaign, MS (Thesis track), Computer Science   **Urbana, IL**
Advisor: Prof. Saurabh Gupta; research in **robotics**   Aug. 2025 – May. 2027
- Coursework: Statistical RL Theory (A+), Advanced NLP (A), Deep Generative Models*, Computer Vision*

Indian Institute of Technology Bombay, B.Tech (with Honors), Computer Science   **Mumbai, India**
GPA: **9.86/10**, ranked **3/194** overall; minors in **machine intelligence** and **mathematics**   Nov. 2021 – May. 2025
- Selected coursework: RL, Robotics, Stat learning, Kernel methods, Formal methods for ML, Crypto, Advanced compilers, Discrete Math/Algo/Automata, Arch/Net/OS/DB/Compilers, Real/Complex/Fourier analysis, Linear/Abstract algebra

RESEARCH EXPERIENCE

Sim2real Dextrous Manipulation | Guide: Prof. Saurabh Gupta   Aug. 2025 – present, **UIUC**
- Working on sim2real transfer for **bimanual dextrous** manipulation tasks focusing on generalization to 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 – Dec. 2025, **UIUC**
- Quantitative evaluation of sycophantic behavior of a hierarchy of **cooperative multi-agent** systems across various tasks
- Designed novel pipeline using evaluated sycophancies to mitigate sycophantic behavior & improve accuracy of the 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
- Showed that quantum resources can improve expressivity using techniques from nonlocal games & **no-signaling theory**
- Proved that surprisingly, XOR soundness anti-concentrates on parallel-repetition of the monogamy-of-entanglement game[†]

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 is guaranteed for **at least 95%** of states despite seeing only 10^{-8}% of all states during 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**
- Selected to be a **Google DeepMind** pre-doctoral researcher (declined for MS at UIUC)   Apr. 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
Frameworks	PyTorch, TensorFlow, ROS, NVIDIA IsaacGym, Drake, OpenAI Gym, NumPy, Pandas, *et al.*, IBM Qiskit

[†] Preprint available upon request.   * Ongoing.