Krishna N Agaram

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EDUCATION

University of Illinois Urbana-Champaign, MS (Thesis track), CS · **Urbana, IL**
Advisor: Prof. Saurabh Gupta · `Aug. 2025 – May. 2027`

Indian Institute of Technology Bombay, B.Tech (with Honors), CS · **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, Adv. compilers, Discrete Math/Algo/Automata, Arch/Net/OS/DB/Compilers, Real/Complex/Fourier analysis, Linear/Abstract algebra

RESEARCH EXPERIENCE

Sim2real Robotic Manipulation | Guide: Prof. Saurabh Gupta · `Aug. 2025 – present`, **UIUC**
- Work on sim2real transfer for **bimanual manipulation** tasks focusing on policy 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 – 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.