Anish Jayant

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Education

University of Southern California — May 2026
B.S. Computer Science, B.S. Applied Mathematics — GPA: 4.0/4

Grad courses: Theoretical Machine Learning, Structure & Dynamics of Networked Information, Algorithms (MS, PhD level)

Research Experience

Memory-Sample Lower Bounds for Ill-Conditioned Regression — Jul. 2024 – Present

- Extending memory sample lower bounds to poorly-conditioned linear systems to resolve a conjecture from STOC'19; jointly advised by Prof. Vatsal Sharan (USC) and Prof. Moïse Blanchard (Columbia/Georgia Tech).
- Analyzed (through simulation and mathematically) the spectral properties of iterative methods for linear regression.
- Surveyed recent breakthroughs in information-theoretic techniques for showing memory-query lower bounds in (non-smooth) convex optimization and branching program lower-bounds for linear systems.
- Assisted in proving novel total variation bounds for detecting noise added to Gaussian mixtures, via Fourier analysis.

Streaming Lower Bounds for Sparse PCA — Jul. 2025 – Present

- Studying memory sample lower bounds for learning sparse spiked signal in Wigner matrices; advised by Prof. Vatsal Sharan
- Derived a novel reduction algorithm from signed support recovery in spiked Wigner to sparse Gaussian mean estimation
- Proved a lower bound for detecting a sparse spike in the Wigner model; working towards similar results for Wishart case.

Robust Federated Optimization — Oct. 2024 – Apr. 2025

- Attempted to extend results in federated optimization to minimax setting, advised by Prof. Sai Praneeth Karimireddy
- Extended convergence rates for gradient mapping on the maximum of functions with bounded Hessian dissimilarity.

Talks & Other Projects

CSCI 699: "Robustness implies Privacy in Estimation" — Fall 2023

- Wrote a final course project and presented recent results connecting robustness and privacy in statistical estimation.
- Gave a follow-up talk on similar material in a future offering of CSCI 699, Fall 2025.

CSCI 476: "Cryptographic Hardness of Learning" — Fall 2024

- Surveyed and presented a classical Boolean circuit lower bound at the intersection of learning theory and cryptography

CSCI 673: "Community Detection using Justified Representation" — Spring 2025

- Assisted in writing a final course project extending ideas in social choice theory to clustering & core detection on graphs.
- Surveyed recent results in correlation clustering and attempted to extend the technique to random geometric graphs (RGGs)

Awards

Trustee Scholarship
Full-tuition scholarship awarded by USC (< 100 students, $250,000 total amount) — Fall 2022 - Spring 2026

Provost Research Fellowship
Research merit recognition awarded by USC ($1,000 per semester, $3,000 per summer) — Fall 2024 - Present

Viterbi Fellowship
Living stipend awarded by USC Viterbi School of Engineering ($1,500 per semester) — Fall 2022 - Spring 2026

WVT Rusch Engineering Honors Program (undergrad. thesis track) — Spring 2023 - Spring 2026

Groups

QuantSC, project member for designing and presenting trading/investment projects — Fall 2022 - Spring 2024
Trojan Climbing, team member participating in weekly practices — Fall 2025 - Present
Viterbi Impact Volunteer, helping support K-12 STEM outreach to underserved communities — 2025 - Present