

ALHAD SETHI

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EDUCATION

Indian Institute of Science (IISc), Bengaluru, IN

Aug 2025 - May 2027 (expected)

M. Tech. (Research) in Electronics and Communication Engineering

CGPA: 8.23/10

- Ongoing work in *sequential learning with Markovian data and bandit algorithms* advised by Prof. Shubhada Agrawal.
- Teaching assistant for Theory of Multi-Armed Bandits (August 2026 term)
- Awarded the **Cisco CNI Fellowship** for AY 2026-27.

Indraprastha Institute of Information Technology (IIIT), Delhi, IN

Jul 2021 - Apr 2025

B. Tech. (Honors) in Computer Science and Applied Mathematics

CGPA: 9.37/10

- *Department Rank 1*, awarded **Institute Silver Medal** for highest CGPA in graduating branch.
- **Thesis**: ‘Learning from Dependent (non-i.i.d.) data,’ advised by Prof. Manuj Mukherjee.
- Teaching assistant for Probability & Statistics (Winter 2023 term) & Statistical Inference (Winter 2025 term).

EXPERIENCE

Quantitative Research Intern, Central Research Team, [Millennium Management](#), Mumbai, IN

May 2024 - July 2024

- Alpha signal research for equity markets using machine learning and statistics for risk-neutral medium frequency trading.
- Designed advanced feature selection and robust outlier detection techniques, extending prior research to build effective alpha modeling pipelines, improving Sharpe ratio across signals.

PUBLICATIONS & PREPRINTS

1. Pratham Gupta*, **Alhad Sethi***, Shubhada Agrawal, “Reliable Scale-Free Bandits via Empirical Likelihood,” submitted to *International Conference on Algorithmic Learning Theory (ALT) 2027* [[paper](#)]
 - Introduced **EL-F**, a parameter-free multi-armed bandit algorithm using empirical likelihood, achieving near optimal regret bounds without prior knowledge of reward distributions or scale.
2. **Alhad Sethi**, Kavali Sofia Sagar, Shubhada Agrawal, Debabrota Basu, P.N. Karthik, “Asymptotically Optimal Sequential Testing with Markovian Data,” *International Conference on Machine Learning (ICML) 2026* [[paper](#), [code](#)]
 - Formulated a sequential hypothesis testing framework for Markov-dependent data streams, proving tight asymptotic sample complexity bounds using martingale based arguments along with information theoretic lower bounds.
3. Manuj Mukherjee, Sagnik Chatterjee, **Alhad Sethi**, “Perfect Secret Key Generation for a class of Hypergraphical Sources,” *International Symposium on Information Theory (ISIT) 2026* [[paper](#)]
 - Constructed explicit, capacity-achieving perfect secret key generation schemes for t -uniform and 3-uniform hypergraphical sources by leveraging star-hypergraph packings and Hamiltonian cycle decompositions.
4. Sagnik Chatterjee*, Manuj Mukherjee*, **Alhad Sethi***, “Generalization Bounds for Dependent Data using Online-to-Batch Conversion,” *Artificial Intelligence and Statistics (AISTATS) 2025* [[paper](#), [poster](#)]
 - Established finite-sample generalization bounds for algorithms trained on non-i.i.d. mixing processes by applying online-to-batch conversions, applying martingale concentration inequalities and showing Wasserstein stability of exponential weights.

* denotes equal contribution.

HONORS & ACHIEVEMENTS

- Secured *All India Rank 110* in Data Science & Artificial Intelligence, Graduate Aptitude Test in Engineering (GATE) 2025.
- Awarded **Summer Undergraduate Research Fellowship (SURF)** grant worth Rs. 40,000 by Institute Innovation Council, IIITD for project entitled ‘Realising Excitons in 2D Janus Materials & Exploring the Possibility of Stable Qubits’.
- Awarded **Kishore Vaigyanik Protsahan Yojana (KVPY)** Fellowship by the Department of Science and Technology, Government of India. (*All India Rank 911* out of more than 100,000 candidates.)
- Secured *All India Rank 2* in Undergraduate Entrance Examination (UGEE) conducted by IIIT Hyderabad
- Competed extensively in quizzing events, winning 40+ podiums; hosted and organized 15+ quizzes as quizmaster.

SKILLS

Python (PyTorch, numpy, sklearn), Keras, TensorFlow

RELEVANT COURSEWORK

Probability Theory, Multi-Armed Bandits, Probabilistic Foundations for Sequential Learning, Theories of Deep Learning, Distributed & Federated Machine Learning, Information Theory, Modern Algorithm Design, Statistical Machine Learning, Theory of Computation, Advanced Linear Algebra