



Abhinav Vaishya

Education

- May 2026 - Present **Ph.D.**, *Mathematics*, Instituto Superior Técnico – Universidade de Lisboa.
Advisor: [Prof. João Ribeiro](#)
Research focus: Error-correcting codes for synchronization errors
- Jul 2018 - Jun 2023 **Bachelor of Technology (Honours) and Master of Science by Research**, *Computer Science and Engineering*, International Institute of Information Technology, Hyderabad (IIIT-H).
Advisor: [Prof. Prasad Krishnan](#)
Thesis Title: Low Complexity Cache-Aided Communication Schemes for Distributed Data Storage and Distributed Computing
Specialization: Algorithms and Theory [[Certificate](#)]

Research Experience

- May 2026 - Present **Researcher**, Instituto de Telecomunicações, Lisboa.
- Jul 2023 - Sept 2025 **Project Associate**, Indian Institute of Science, Bangalore (IISc).
 - Erasure decoding of Quantum LDPC codes
 - Worked on erasure decoding of Quantum Expander Codes. (IEEE ISIT, 2025)
 - Worked on devising a better decimation technique for belief-propagation-based erasure decoding of general Quantum LDPC codes. (IEEE ITW, 2025)
 - Gottesman-Kitaev-Preskill (GKP) codes
 - Worked on constructing multimode GKP codes with better error-correcting properties through the lens of lattice theory.
 - Advisor: [Prof. P Vijay Kumar](#)
- Jun 2022 - Jun 2023 **Research Intern**, Technical University of Munich (Remote).
 - Codes for Distributed Storage and Coding Theory for Blockchains
 - Did comprehensive literature survey on the topics and presented the same.
 - Advisor: [Dr. Rawad Bitar](#)
- May 2021 - Jun 2023 **Research Assistant**, IIIT-H.
 - Coded Caching via Locally Recoverable Codes
 - Constructed a scheme with parameters identical to the rate-optimal Maddah-Ali-Niesen scheme.
 - Have a few more interesting results on the connection between Coded Caching and Locally Recoverable Codes.
 - Coded Caching via Subspace Designs (IEEE JSAIT, 2023)
 - Worked on the proof and numerical results for a coded caching (and distributed computing) scheme based on the q-analogs of combinatorial designs, i.e., subspace designs.
 - Coded Data Rebalancing for Distributed Storage Systems with Cyclic Storage
 - Constructed rebalancing schemes for single-node removal and addition scenarios in replication-based distributed storage systems. (IEEE ITW, 2022)
 - Derived a general lower bound using index coding proof techniques. (IEEE TIT, 2026)
 - Advisor: [Prof. Prasad Krishnan](#)

Aug 2020 - Apr 2021 **Undergraduate Researcher**, IIIT-H.
○ Coded Data Rebalancing for Distributed Storage Systems
○ Advisor: [Prof. Prasad Krishnan](#)

Work Experience

Jan 2023 - May 2023 **Teaching Assistant**, IIIT-H.
○ Information-Theoretic Methods in Computer Science, Spring '23
○ Introduction to Coding Theory, Spring '22
○ Linear Algebra, Spring '21
○ The role involved conducting tutorials, setting and evaluating assignments and exams.

Jun 2019 - Oct 2019 **Problem Setter**, Hackerrank.
○ Prepared various original programming and algorithmic problems along with strong testcases.

Aug 2018 - Dec 2018 **Web Developer**, VLEAD, IIIT-H.
○ Worked on building a web application for interactive online learning modules.

Publications

Journals

- J1. **Abhinav Vaishya**, Athreya Chandramouli, Srikar Kale, Prasad Krishnan, "Coded Data Rebalancing for Distributed Data Storage Systems with Cyclic Storage", IEEE Transactions on Information Theory (TIT), 2026. [[IEEE](#)]
- J2. Shailja Agrawal, K V Sushena Sree, Prasad Krishnan, **Abhinav Vaishya**, Srikar Kale, "Cache-Aided Communication Schemes via Combinatorial Designs and their q -analogs", IEEE Journal on Selected Areas in Information Theory (JSAIT), 2023. [[IEEE](#)]

Conferences

- C1. Gayathri R., Shobhit Bhatnagar, **Abhinav Vaishya**, P Vijay Kumar, "An Improved Decimation Technique for Erasure Decoding of Quantum LDPC Codes", IEEE Information Theory Workshop (ITW), 2025. [[IEEE](#)]
- C2. Jefrin Sharmitha Prabhu*, **Abhinav Vaishya***, Shobhit Bhatnagar, Aryaman Manish Kolhe, V. Lalitha, P. Vijay Kumar, "On the Efficacy of the Peeling Decoder for the Quantum Expander Code", IEEE International Symposium on Information Theory (ISIT), 2025. [[IEEE](#)][[arXiv](#)]
- C3. Athreya Chandramouli, **Abhinav Vaishya**, Prasad Krishnan, "Coded Data Rebalancing for Distributed Data Storage Systems with Cyclic Storage", IEEE Information Theory Workshop, 2022. [[IEEE](#)][[Slides](#)]

* indicates equal contribution

Course Projects (Selected)

Spring 2021 **Encoding and Decoding of Reed Solomon Codes (Language: Python 3)**
○ Implemented the encoding and decoding procedures of Reed Solomon Codes. Sympy was used in the implementations. This project was a part of the course Topics in Coding Theory. [[GitHub](#)]

Spring 2020 **Distributed Systems and Algorithms**
○ Implemented many graph based and sorting algorithms, a simple single server architecture (supports multiple clients), for distributed systems using OpenMP(C++), MPI(C++), Cuda(C++/Python), and RMI(Java). This project was a part of the course Distributed Systems. [[GitHub](#)]

Spring 2020 **Applications of Linear Programming (Language: Python 3)**

- Used Linear Programming for solving various interesting problems such as - Jigsaw Puzzle, Sudoku, Convex Hull, and Largest Circle in a Polygon. This project was a part of the course Optimization Methods. [[GitHub](#)]

Relevant Courses

Algorithms and Theory (at IIIT-H) Algorithms, Complexity and Advanced Algorithms, Computational Complexity Theory, Principles of Information Security, Introduction to Coding Theory*, Topics in Coding Theory, Information-Theoretic Methods in Computer Science*, Advanced Mathematical Structures.

Theory (at IISc) Quantum Error-Correcting Codes**

* indicates that I attended the course as a Teaching Assistant

** indicates that I audited the course

Skills

Languages C, C++, Python, MATLAB, Java, Javascript, SQL, Erlang, TeX

Libraries numpy, scipy, sympy, MPI

Miscellaneous

- Selected for the school and workshop on HDX and Codes at ICTS, Bengaluru. [[Link](#)][[Link](#)]
- Ranked 88th in ACM-ICPC Online Round 2019-20. (Honorable Mention) [[Certificate](#)]
- Selected for the Onsite Round of ACM-ICPC Asia Regionals, Amritapuri 2019-20.
- Certificate for Problem Solving (Advanced) by Hackerrank. It covers topics like Data Structures such as Trees, Graph Traversal, using Dynamic Programming and Specialized Algorithms, among others. [[Certificate](#)]
- Merit List awardee.

References

Prof. P Vijay Kumar

(Mentor at IISc)

IISc, Bengaluru

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Prof. Lalitha Vadlamani

(Mentor and Collaborator)

IIIT Hyderabad

✉ lalitha.v@iiit.ac.in

Prof. Prasad Krishnan

(Undergraduate and Master's Mentor)

IIIT Hyderabad

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