



# Abhinav Vaishya

## Education

- 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: [Dr. Prasad Krishnan](#)  
Thesis Title: Low Complexity Cache-Aided Communication Schemes for Distributed Data Storage and Distributed Computing  
Specialization: Algorithms and Theory [[Certificate](#)]

## Research Experience

- Jul 2023 - Present **Research Associate**, Indian Institute of Science, Bangalore (IISc).
  - Quantum Error Correction
  - Advisor: [Dr. P Vijay Kumar](#)
- Jun 2022 - Jun 2023 **Research Intern**, Technical University of Munich (Remote).
  - Codes for Distributed Storage
  - Coding Theory for Blockchains (Literature Review)
  - Advisor: [Dr. Rawad Bitar](#)
  - Took a break from this work because of other commitments
- May 2021 - Jun 2023 **Research Assistant**, IIIT-H.
  - Coded Caching via Locally Recoverable Codes (Few results drafted)
  - Coded Caching via Subspace Designs (Accepted at IEEE JSAIT, 2023)
  - Coded Data Rebalancing for Distributed Storage Systems with Cyclic Storage (Accepted at IEEE ITW, 2022)
  - Advisor: [Dr. Prasad Krishnan](#)
- Aug 2020 - Apr 2021 **Undergraduate Researcher**, IIIT-H.
  - Coded Data Rebalancing for Distributed Storage Systems
  - Advisor: [Dr. Prasad Krishnan](#)
- May 2019 - Jun 2020 **Undergraduate Researcher**, IIIT-H.
  - A software framework for annotation of manuscript document images (Showcased at a workshop, ICDAR, 2019)
  - Advisor: [Dr. Ravi Kiran Sarvadevabhatla](#)

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## 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.

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## Publications

- 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][Arxiv]
  - Athreya Chandramouli\*, **Abhinav Vaishya**\*, Prasad Krishnan, "Coded Data Rebalancing for Distributed Data Storage Systems with Cyclic Storage", IEEE Information Theory Workshop, 2022. [IEEE][Arxiv][Slides]
- \* indicates equal contribution

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## 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.
- Spring 2020 **Distributed 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.
- 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.

- Spring 2019 **Proxy Server (Language: Python 3)**
- o Implemented a client-server model using socket programming along with a proxy server. Blacklisting and caching were also implemented. This project was a part of the course Computer Networks.
- Monsoon 2018 **Interactive User Defined Shell (Language: C)**
- o Implemented a terminal based shell using C. It supports piping, I/O redirection, signal handling, background and foreground process management, etc. This project was a part of the course Operating Systems.

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## 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

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## Skills

Languages C, C++, Python, MATLAB, Java, Javascript, SQL, Erlang, TeX  
Libraries numpy, scipy, sympy, MPI

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## Miscellaneous

- 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.