

ABOUT ME

I am a final year Ph.D. scholar completing my doctoral research at Indian Institute of Technology Madras. My research is in the area of quantum error correction codes. More specifically, my work focuses on reducing the communication cost for secret recovery in quantum secret sharing schemes. In the past, I also worked on problems in compressed sensing, image processing and distributed storage codes. I am currently looking for a research position in academia or industry to work on quantum error correction and related topics.

RESEARCH INTERESTS

Classical and quantum error correction codes, information theory, distributed storage and signal processing

EDUCATION

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| Ph.D. in Electrical Engineering
Indian Institute of Technology Madras
<i>Advisor</i> : Prof. Pradeep Sarvepalli
<i>Thesis</i> : Communication Efficient Quantum Secret Sharing | Jan 2016 - Mar 2023
(Expected) |
| M.E. in Telecommunication Engineering
Indian Institute of Science Bangalore
<i>Advisor</i> : Prof. P Vijay Kumar
<i>Thesis</i> : Storage Overhead vs. Repair Bandwidth Tradeoff in Exact Repair Regenerating Codes | Aug 2012 - Jul 2014 |
| B.Tech. in Electronics & Communication Engineering
Amrita School of Engineering Coimbatore
<i>Group project</i> : Compressed sensing in ECG signals | Aug 2008 - Jul 2012 |

WORK EXPERIENCE

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| Engineer
Mobile-Video team, Ittiam systems, Bangalore
Development of video codecs in H264 and HEVC standards | Aug 2014 - May 2015 |
| Project Associate
Codes and Signal Design lab, Indian Institute of Science Bangalore
Project for intrusion detection using Wireless Sensor Networks | Jun 2015 - Dec 2015 |

PUBLICATIONS

Journal papers

- [1] K. Senthooor and P. K. Sarvepalli, "Theory of Communication Efficient Quantum Secret Sharing," *IEEE Transactions on Information Theory*, vol. 68, no. 5, pp. 3164–3186, 2022.
- [2] K. Senthooor and P. K. Sarvepalli, "Communication efficient quantum secret sharing," *Physical Review A*, vol. 100, no. 5, p. 052313, 2019.
- [3] B. Sasidharan, N. Prakash, M. N. Krishnan, M. Vajha, K. Senthooor, and P. V. Kumar, "Outer bounds on the storage-repair bandwidth trade-off of exact-repair regenerating codes," *International Journal of Information and Coding Theory*, vol. 3, no. 4, pp. 255–298, 2016.

Conference proceedings

- [4] K. Senthooor and P. K. Sarvepalli, "Universal Communication Efficient Quantum Threshold Secret Sharing Schemes," in *Proc. 2020 IEEE Information Theory Workshop (ITW), Riva del Garda, Italy*.

- [5] K. Senthoo, B. Sasidharan, and P. V. Kumar, “Improved layered regenerating codes characterizing the exact-repair storage-repair bandwidth tradeoff for certain parameter sets,” in *Proc. 2015 IEEE Information Theory Workshop (ITW), Jerusalem, Israel*.
- [6] B. Sasidharan, K. Senthoo, and P. V. Kumar, “An improved outer bound on the storage-repair-bandwidth tradeoff of exact-repair regenerating codes,” in *Proc. 2014 IEEE International Symposium on Information Theory*, pp. 2430–2434.

Preprint

- [7] K. Senthoo and P. K. Sarvepalli, “Concatenating Extended CSS Codes for Communication Efficient Quantum Secret Sharing,” *e-print quant-ph/2002.09229*, 2022.

PRESENTATIONS

- Presentation at AQIS 2018, Nagoya, Japan.
- Virtual presentation at IEEE ITW 2020, Riva del Garda, Italy.
- Poster at Indo-German Symposium on Quantum Science and Technologies 2020, IIT Madras, India.

PROGRAMMING

Proficient in C, C++ and MATLAB.

TEACHING EXPERIENCE

Applied Linear Algebra I, Jul - Nov 2018

- One of four teaching assistants for a class of about 50 students.
- Conducted weekly tutorial sessions and discussed the solutions for problem sets.
- Evaluated video presentations by students on recent research articles.

Information Theory (online mode), Jul - Nov 2022

- One of seven teaching assistants for a class of about 60 students.
- Conducted weekly tutorial sessions for a group of 10 students.
- Partly evaluated the mini-quiz and final exam papers.

I worked as teaching assistant also in courses such as Error Control Codes, Modern Coding Theory and Advanced Topics in Quantum Information during my Ph.D. programme.

ACADEMIC SERVICES

Paper reviews

- Reviewed a paper for the journal IEEE Transactions on Information Theory in 2021.
- Reviewed three papers for the National Conference on Communications during 2017-2019.
- Reviewed a paper for IEEE International Symposium on Information Theory 2014.

Event management

- Partly organized the transportation of the speakers in Joint Telematics Group Summer School 2019 at IIT Madras.
- Helped with taking photographs in Electrical Engineering Symposium 2018 at IIT Madras.