

ABOUT ME

I am a research scholar completing my PhD programme 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

WORK EXPERIENCE

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

EDUCATION

| | |
|---|---------------------|
| Ph.D. in Quantum Error Correction Codes | Jan 2016 - Mar 2023 |
| Indian Institute of Technology Madras | (Expected) |
| <i>Advisor</i> : Prof. Pradeep Sarvepalli | |
| <i>Thesis</i> : Communication Efficient Quantum Secret Sharing | |
| M.E. in Telecommunication Engineering | Aug 2012 - Jul 2014 |
| 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 | |
| B.Tech. in Electronics & Communication Engineering | Aug 2008 - Jul 2012 |
| Amrita School of Engineering Coimbatore | |
| <i>Group project</i> : Compressed sensing in ECG signals | |

PUBLICATIONS

Journal papers

- [1] K. Senthoo and P. K. Sarvepalli. "Theory of Communication Efficient Quantum Secret Sharing". In: *IEEE Trans. Inform. Theory* 68.5 (2022), pp. 3164–3186. URL: <https://ieeexplore.ieee.org/document/9674910>.
- [2] K. Senthoo and P. K. Sarvepalli. "Communication efficient quantum secret sharing". In: *Phys. Rev. A* 100.5 (2019), p. 052313. URL: <https://journals.aps.org/pra/abstract/10.1103/PhysRevA.100.052313>.
- [3] B. Sasidharan, N. Prakash, M. N. Krishnan, M. Vajha, K. Senthoo, and P. V. Kumar. "Outer bounds on the storage-repair bandwidth trade-off of exact-repair regenerating codes". In: *International Journal of*

Conference proceedings

- [4] K. Senthoo and P. K. Sarvepalli. “Universal Communication Efficient Quantum Threshold Secret Sharing Schemes”. In: *Proc. 2020 IEEE Information Theory Workshop (ITW), Riva del Garda, Italy*. URL: <https://ieeexplore.ieee.org/abstract/document/9457576>.
- [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*. URL: <https://ieeexplore.ieee.org/abstract/document/7133121>.
- [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. URL: <https://ieeexplore.ieee.org/abstract/document/6875270>.

Preprint

- [7] K. Senthoo and P. K. Sarvepalli. “Concatenating Extended CSS Codes for Communication Efficient Quantum Secret Sharing”. In: *e-print quant-ph/2002.09229* (2022). URL: <https://arxiv.org/abs/2211.06910>.

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 programming in C, C++ and MATLAB.

TEACHING ASSISTANCE

I worked as a Teaching Assistant during my Ph.D. for undergraduate/graduate courses such as Applied Linear Algebra, Information Theory, Error Control Coding and Advanced Topics in Quantum Information.

PAPER REVIEWS

I reviewed research articles in the area of error correction codes for the following conferences and journal.

- National Conference on Communications organized by Joint Telematics Group
- IEEE International Symposium on Information Theory
- IEEE Transactions on Information Theory

REFERENCES

1) Prof. Pradeep Sarvepalli
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Indian Institute of Technology Madras.
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2) Prof. P. Vijay Kumar
Honorary Professor,
Department of Electrical Communication Engineering,
Indian Institute of Science Bangalore.
Email : pvk1729@gmail.com

3) Prof. Prabha Mandayam
Associate Professor,
Department of Physics,
Indian Institute of Technology Madras.
Email : prabhamd@physics.iitm.ac.in