Manideep MAMINDLAPALLY

IEEE student member
Student, Indian Institute of Technology Kharagpur

RESEARCH INTERESTS

QUANTUM INFORMATION THEORY | QUANTUM COMPUTATION | COMPUTATIONAL COMPLEXITY | CRYPTOGRAPHY

EDUCATION

CURRENT	Dual-Degree (BTech+MTech)	INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR MAJOR: Electronics & Electrical Communication Engineering MASTERS SPECIALISATION: Telecommunication System Engg. MINOR: Computer Science Engineering	9.16/10 (CGPA) 9.09/10 (ACGPA)
APRIL 2017	TSBIE	FIITJEE JUNIOR COLLEGE, HYDERABAD	97.0%
APRIL 2015	ICSE	JOHNSON GRAMMAR SCHOOL(ICSE), HYDERABAD	95.7%

PUBLICATIONS

CONFERENCES:

- Mamindlapally M, Yadav AK, Mishra M, Budkuley AJ. Commitment capacity under cost constraints. *In 2021 IEEE International Symposium on Information Theory (ISIT) 2021 Jul 12* (pp. 3208-3213). IEEE. [IEEE Xplore]

- Yadav AK, Mamindlapally M, Budkuley AJ, Mishra M. Commitment over compound binary symmetric channels. *In 2021 National Conference on Communications (NCC) 2021 Jul 27* (pp. 1-6). IEEE. [IEEE Xplore]

- Yadav AK, Mamindlapally M, Joshi P, Budkuley AJ. On Commitment over General Comound Channels. *In 2022 IEEE Conference on Communication Systems and Networks (COMSNETS) 2022 Jan 4.* IEEE. [Accepted]

- (∗) Budkuley AJ, Joshi P, Mamindlapally M, Yadav AK. On the Commitment Capacity of Reverse Elastic Channels. *In 2021 IEEE Information Theory Workshop (ITW) 2021 Oct 17* (pp. 1-6). IEEE. [IEEE Xplore]

- Mamindlapally M, Winter A. Singleton bounds for entanglement assisted classical quantum error correcting codes. *2022 IEEE International Symposium on Information Theory(ISIT) 2022.* IEEE. [In preparation] [arxiv preprint very soon]

JOURNALS:

- (∗) Budkuley AJ, Joshi P, Mamindlapally M, Yadav AK. On reverse elastic channels and the asymmetry of commitment capacity under channel elasticity. *2021 IEEE Journal for Transactions in Information Theory(JSAC) 2021.* IEEE. [Under Minor Revision] [arXiv preprint arXiv:2111.08477]

- M. Mamindlapally, A. K. Yadav, M. Mishra and A. J. Budkuley, "Commitment Capacity under Cost Constraints," IEEE Transactions in Information Theory, 2021 [Under preparation]

- A. K. Yadav, M. Mamindlapally, A. J. Budkuley and M. Mishra, "Commitment over Compound Binary Symmetric Channels," IEEE Transcactions in Communications, 2021 [Under preparation]

OTHER:

- M. Mamindlapally "Unconditionally secure Commitment Problem," *Bachelor Thesis under guidance of Prof. A. J. Budkuley* [Thesis]

(∗) - author names in alphabetical order.

Feel free to contact me if you are interested in looking at the work still to be published or the extended versions of the already published ones.

RESEARCH EXPERIENCE

MAY 2021 - OCT 2021	**SINGLETON BOUNDS FOR EACQ ERROR CORRECTING CODES** *Guide: Prof. Andreas Winter* | UNIVERSITAT AUTÒNOMA DE BARCELONA, SPAIN Designed a communication model for Entanglement-Assisted Classical and Quantum Information and allowing catalysis(recycling) of *qbits*, *cbits* and *ebits*. Using information theoretic deductions, found a converse system of inequalities for these resources. By specialising this converse to erasure channels we got a triple-trade-off Singleton bound region, that supersedes all the previously known Singleton bounds.
DEC 2020 - Now	**COVERT COMMUNICATION OVER QUANTUM CHANNELS** *Guide: Prof. Ligong Wang* | CNRS, FRANCE Looked at a communication problem (communication without detection)covert communication. Studied its implementation and performance over classical channels and classical quantum channels. Investigating the throughput over pure quantum channels.

May 2020 - Now	**Security and Privacy - Commitment Problem** *Guide: Prof. Amitalok J Budkeley* | IIT Kharagpur, India Studied information theoretic security primitives **Bit-Commitment** and **Oblivious Transfer**. Information theoretically derived the communication capacity limits for commitment over general discrete memoryless channels with certain cost constraints. Further developed a dual formulation of the same capacity limit. Studied different unreliable noise models *Compound Binary Symmetric Channels, Unfair Noisy Channels, Elastic Channels* and *Reverse Elastic Channels*. Found the commitment capacity and observed the interplay between different forms of unreliability. Studying commitment over quantum channels in a post quantum setting
Jan 2020 - Jun 2020	**Optimizing codes for Peak Age of Information** *Guide: Prof. Amitalok J Budkeley* | IIT Kharagpur, India Employed the Random arrival process theory to get a probabilistic expression for the metrics 'Peak age of Information' and 'Age of Information'. For **Markov sources**, obtained a closed form expression using matrix manipulations. Designing a source code to optimise that metric. Comparing this with other standard source coding schemes.

Talks and Posters

- Talked and prsented about our published work "Commitment Capacity under Cost Constraints" at *IEEE International Symposium on Information Theory (ISIT)* 2021 Conference. [*short, long* videos]

- Presented a poster on "Commitment over Unreliable channels" with Pranav Joshi and Anuj K Yadav at 2021 IEEE International Symposium on Information Theory.

- Presented a poster on "Role of Costs in Commitment over Noisy Channels" at *IEEE North American School of Information Theory (NASIT) 2021*. [*poster*]

- Submitted a poster abstract on "Singleton bounds for EACQ Error Correcting Codes" [*Poster*]

- Submitted to Graduate Forum at IEEE Conference for Communications and Network Systems (COMSNETS) 2021 to talk about my masters thesis "On Unconditionally secure commitment over unreliable noisy channels."

Teaching

- Teaching Assistant for the theory course, EC60083 *Information Theory and Coding Techniques*, Autumn 2021, IIT Kharagpur.

Technical Skills

Programming Languages:	C, C++, C#,Javascript, Python, Verilog
Libraries/Frameworks:	PyTorch, Flask, Qiskit
Software:	MATLAB, Xilinx, Unity Game Egnine, EasyEDA, EdSim51

Relevant Coursework

complete list *here*   * - currently enrolled

Mathematics:	Matrix Algebra, Probability & Stochastic Processes, Operations Research
Computer Science:	Algorithms, Algorithmic Game Theory, Computational Number Theory, Foundations of Computer Science*,, Computational Complexity*, Neural Networks & Applications
Electronics &: Communication	Information Theory & Coding Techniques, Linear Algebra & Error Control Techniques, Modern Digital Communication Techniques, Mobile Communication and Fading, Digital Voice & Picture communication, Telecommunication Switching Networks, Machine Intelligence & Expert Systems*, Digital Signal Processing
Physics:	Quantum Mechanics & Quantum Computing

Academic Achievements

- Secured All India Ranks 1479 and 884 in the JEE Mains and Advanced exams where over one million students applied.

- Received a state top hundred certificate for the INPhO(Indian National Physics Olympiad) 2016 and INChO(Indian National Chemistry Olympiad) 2016.

- Secured second at the city level of the Zonal Informatics Olympiad 2017 and qualified for the National Informatics Olympiad 2017.

Extra curricular activities

- Executive Editor at The Scholars' Avenue, a campus media body at IIT Kharagpur.

- Secured BRONZE in the Cartooning event of the Inter Hall General Championship 2020, IIT Kharagpur

- Volunteer at the National Service Scheme (NSS) between 2017-19. We taught in primary schools and helped construct public toilets in rural India.