Manideep Mamindlapally

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IEEE Student Member
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Research Interests

Quantum Complexity Theory | Complexity Theory | Non Local Games | Quantum Information Theory

Education

Jul 2022	Dual-Degree (BTech+MTech)	Indian Institute of Technology, Kharagpur MAJOR: Electronics & Electrical Communication Engineering MINOR: Computer Science Engineering *Best bachelor thesis 2021*	9.24/10 (CGPA) 9.16/10 (Minor GPA)
April 2017	TSBIE	FIITJEE Junior College, Hyderabad	97.0%
April 2015	ICSE	Johnson Grammar School(ICSE), Hyderabad	95.7%

Academic Honors

- **Best Paper Award** at the IEEE Conference on Communication Systems and Networks (COMSNETS) 2022 for the Graduate Forum event.
- **Nilanjan Ganguly Memorial Award** and an Endowment prize of Rs 10,000 for the **best bachelor thesis** in my cohort of 120+ students at E&EC Department, IIT Kharagpur for the session 2020-21.
- Student Travel Awards to travel and present my work at COMSNETS 2022, ISIT 2022 and ITW 2022 conferences.
- FIITJEE Gold Medal and a reward of Rs 2,00,000 for securing All India Ranks 1479 and 884 in the JEE Mains and Advanced 2017 exams where over one million students applied.
- Secured second at the city level of the Zonal Informatics Olympiad 2017 and qualified for the National Informatics Olympiad 2017.

Research Experience

Oct 2022 - Now — Simulation Proof Techniques for Multi Party Computations (*Guide: Akshayaram Srinivasan*)
Junior Research Fellowship at Tata Institute of Fundamental Research, Mumbai
- Studying literature on Simulation Proof technique for proving the security of general multi-party computations.

May 2021 - Oct 2021 — Singleton Bounds for EACQ Error Correcting Codes (*Guide: Andreas Winter*)
Summer Internship (Remote) at Universitat Autònoma de Barcelona, Spain
- Designed a generalised communication model for Entanglement-Assisted Classical and Quantum Information, allowing catalysis(recycling) of *qbits*, *cbits* and *ebits*. Found a singleton bound capacity region for such codes over quantum erasure channels.
- Presented at ISIT 2022 conference, Helsinki, Finland
- Submitted to IEEE Transactions in Information Theory 2022 journal.

Dec 2020 - Mar 2021 — Covert Communication over Quantum channels (*Guide: Ligong Wang*)
Winter Internship (Remote) at CNRS, France
- Studied covert communication problem over classical channels and classical-quantum channels. Attempted to study the problem over purely quantum channels.

May 2020 - Now — Security and Privacy - Commitment Problem (*Guide: Prof. Amitalok J Budkeley*)
Bachelor and Master Thesis Research at IIT Kharagpur, India
- Studied security primitives **Bit-Commitment** and **Oblivious Transfer** using noisy channels.
- Characterised maximum commitment throughputs for different unreliable noisy channels - Compound-BSCs, RECs, Asymmetric-UNCs; Unfair Gaussian Channels, general alphabet Compound DMCs, and cost-constrained DMCs.
- Presented the results at ISIT 2021, NCC 2021, ITW 2021 conferences virtually and at COMSNETS 2022, ITW 2022 physically.
- Published in JSAC 2021 journal.

Jan 2020 - Jun 2020 — Optimizing codes for Peak Age of Information (*Guide: Prof. Amitalok J Budkeley*)
Recreational Research at IIT Kharagpur, India
- Characterised 'Age of Information' for Markov Information sources as an optimization problem over a single letter expression.

Professional Service

- Reviewer for the IEEE Transactions in Information Theory journal since October 2022.
- Reviewer for the IEEE Information Theory Workshop (ITW) 2022 conference.
- Volunteer for the IEEE Information Theory Workshop (ITW) 2022 conference.

Teaching

- Teaching Assistant for EC39006 *Digital Signal Processing Lab*, Spring 2022, IIT Kharagpur.
- Teaching Assistant for EC60083 *Information Theory and Coding Techniques*, Autumn 2021, IIT Kharagpur.

Publications and Theses

Conferences:

- (∗) Budkuley AJ, Joshi P, Mamindlapally M, Yadav AK. Commitment over Unreliable Noisy Channels: When Awareness Meets Control. *In 2022 IEEE Information Theory Workshop (ITW) 2022 Nov 9*. IEEE. [Accepted]
- Mamindlapally M, Winter A. Singleton bounds for entanglement assisted classical quantum error correcting codes. *2022 IEEE International Symposium on Information Theory (ISIT) 2022 Jun 26* (pp. 85-90). 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* (pp. 488-496). IEEE. [IEEE Xplore]
- (∗) 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]
- 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]
- 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]

Journals:

- Mamindlapally M, Winter A. Singleton bounds for entanglement assisted classical quantum error correcting codes. *2022 IEEE Transactions in Information Theory 2022*. IEEE. [Under Review] [Pre-print arXiv:2202.02184]
- (∗) 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 Selected Areas in Communication(JSAC) 2021*. IEEE. [IEEE Xplore] [Pre-print arXiv:2111.08477]

Theses:

- M. Mamindlapally. On Unconditionally Secure Commitment over Unreliable Noisy Channels. *Master thesis under guidance of Amitalok Budkuley* [Thesis]
  🏆 **Best Paper Award** at the Graduate Forum event, COMSNETS 2022 conference
- M. Mamindlapally. Unconditionally secure Commitment Problem. *Bachelor thesis under guidance of Amitalok Budkuley* [Thesis]
  🏆 **Best bachelor thesis** in my cohort of E&EC students for Academic session 2020-21

(∗) - 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.

Talks and Posters

- Series of seminar talks (virtual) on "Classical Verification of Quantum Computations" (paper by U. Mahadev) to *Rahul Jain*'s group at *Centre for Quantum Technologies (CQT), National University of Singapore*. [*Scribe*] [*Notes*]
- Invited seminar talk "On Unconditionally Secure Commitment over Unreliable Noisy Channels" (my thesis topic) at Technische Universität München, Munich where I was hosted by *Christian Deppe* and *Holger Boche*.
- Conference talk on "Commitment over Unreliable Noisy Channels: When awareness meets control" at *IEEE Information Theory Workshop (ITW) 2022* conference, Mumbai, India.
- Conference talk on "Singleton bounds for entanglement assisted classical-quantum error correcting codes" at *IEEE International Symposium on Information Theory (ISIT) 2022* conference, Helsinki, Finland.
- Graduate Forum talk on "On Unconditionally secure commitment over unreliable noisy channels" at *IEEE Conference for Communications and Network Systems (COMSNETS) 2022* conference, Bengaluru, India.
  🏆 **Best Paper Award**
- Conference talk (virtual) on "Commitment Capacity under Cost Constraints" at *IEEE International Symposium on Information Theory (ISIT) 2021* Conference. [*short video*] [*long video*]
- Poster presentations at QIP 2022, NASIT 2021 and ISIT 2021 conferences. [Poster QIP 2022] [Poster NASIT 2021]

Relevant Coursework

complete list here

Mathematics:	Matrix Algebra, Probability & Stochastic Processes, Operations Research
Computer Science:	Algorithms, Algorithmic Game Theory, Computational Number Theory, Foundations of Computer Science, Computational Complexity, Approximation & Online Algorithms, Computer Architecture & Operating Systems, 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

Extra curricular activities

- Making Digital Art. I upload on Instagram @manideep_doodles
- Was an 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.
- Assistant Head Boy at Johnson Grammar School(ICSE), Hyderabad for the academic session 2014-15.