ANJANA A MAHESH

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PERSONAL INFORMATION

***Citizenship* : Indian**

***Date of birth* : 18 April 1991**

***Place of birth* : Trivandrum, Kerala, India.**

EDUCATION

Doctor of Philosophy (Ph.D) ***August 2018 - Present***
Thesis: "Index Coding over Noisy Channels and Some Applications"
Date of Thesis submission: 30 July 2023
Branch: Electrical Communication Engineering CGPA - 9.7/10
University: Indian Institute of Science (IISc), Bengaluru.

Master of Engineering (M.E) ***August 2014 - June 2016***
Specialization: Telecommunications CGPA - 7.8/8
Branch: Electrical Communication Engineering
University: Indian Institute of Science (IISc), Bengaluru.

Bachelor of Technology (B.Tech) ***July 2009 - May 2013***
Branch: Electronics and Communication Engineering CGPA - 8.82/10
University: Kerala University, Trivandrum.

RESEARCH INTERESTS

My current research interests are in the areas of index coding with applications to coded caching, D2D communication, and distributed computing.

COURSES CREDITED AT IISC

Digital Communication, Error Correcting Codes, Random Process, Information Theory, Communication Networks, Wireless Communication, Detection and Estimation Theory, Wireless Networks, Multi-user Detection, Space Time Signal Processing, Next Generation Wireless Systems, Graph Theory, Quantum Error Correcting Codes.

SOFTWARE PROFICIENCY

C, C++, MATLAB

WORK EXPERIENCE

Engineer, Qualcomm India Pvt Ltd, Bangalore. July 2016 - August 2017.
Worked in Modem Hardware Team. Responsible for developing hardware models on SystemC and C++ platforms for Derate matching/HARQ combining Engine (DHE) inside Demodulator module of a 4G Release 13 modem. This model was used by the Design Verification team to verify the corresponding RTL design.

Engineer, Lekha Wireless Solutions Pvt Ltd, Bangalore. September 2017 - July 2018.
Part of the Systems R&D team responsible for design and development of algorithms & IP for next generation wireless networks. Developed MATLAB models

- based on 3GPP Release-15 standards for 5G NR for encoding and decoding modules for Polar and LDPC codes, generation and decoding of PSS and SSS, PBCH processing chain including scrambling, CRC attachment, channel coding, modulation and generation of SS/PBCH block by appropriate resource element mapping. This model was used for verifying the L1 stack of the UE and gNB reference solution.
- based on 3GPP Release-13 for NPBCH including repetition combining and decoding which was used for verifying an LTE Cat NB1 UE reference solution.
- for single user and multi-user MIMO transmit precoders including Zero-Forcing, Block Diagonalization and Tomlinson-Harashima-Precoder and MIMO decoders like ML and Zero forcing detectors.

Developed an algorithm for efficient soft decoding of 256-QAM used in IEEE 802.16 (WiMAX).

ACHIEVEMENTS

- **Winner of Qualcomm Innovation Fellowship India 2020.**
- **Received G. B. Meemamsi Award given to the topper of ME(Telecom) students of Dept. of ECE, IISc, for the year 2016.**
- **Received S.V.C. Aiya Medal for the best ME(Telecom) student from Dept. of ECE, IISc, for the year 2016.**
- **Secured All India Rank of 27 (among 250000 candidates) in ECE GATE 2014.**
- **Secured 9th rank for BTech ECE 2013 (among 1200 students enrolled) from Kerala University.**
- **Received Best Outgoing Student Award from Government Engineering College, Trivandrum, Kerala, given to the batch topper in ECE Dept, 2009-2013.**

PUBLICATIONS

Journals

1. **Anjana A. Mahesh, A. Chhetri and B. S. Rajan, "Role of Index Codes in Noisy Broadcasting with Side Information and Index Coded QAM for Prioritized Receivers," IEEE Transactions on Communications, Vol.71, No. 7, pp. 3889-3904, July 2023.**
2. **Sreelakshmi P., J. Pachat, Anjana A. Mahesh, Deepthi P.P., and B. S. Rajan, "Index Coded-NOMA in Vehicular Ad Hoc Networks," IEEE Transactions on Vehicular Technology, Vol.71, No.9, pp. 10073-10087, September 2022.**
3. **J. Pachat, Anjana A. Mahesh, Deepthi P.P., and B. S. Rajan, "Embedded Index Coding with Consecutive Side Information in Vehicle to Vehicle Communication," IEEE Transactions on Vehicular Technology, Vol.71, No.8, pp. 9113-9118, August 2022.**
4. **Anjana A. Mahesh, N. S. Karat, and B. S. Rajan, "An Optimal Error Correction Scheme for the Shuffle Phase of A MapReduce Distributed Computing System," IEEE Communications Letters, Vol.25, No.12, pp. 3765-3769, December 2021.**
5. **J. Pachat, N. S. Karat, Anjana A. Mahesh, Deepthi P.P., and B. S. Rajan, "Index Coded PSK Modulation in Vehicle to Vehicle Communication," IEEE Transactions on Vehicular Technology, Vol.70, No.5, pp. 4753-4766, May 2021.**

Conferences

1. **K. Sailahari, Anjana A. Mahesh, Charul Rajput and B. Sundar Rajan, "Performance of Maddah-Ali-Niesen Scheme for Multi-Access Coded Caching Scheme over Noisy Channels," Proceedings of IEEE 34th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), Toronto, Canada, 5-8 September 2023.**
2. **Anjana A. Mahesh, C. Rajput, B. Rupa, and B. S. Rajan, "Average Probability of Error for Single Uniprior Index Coding over Rayleigh Fading Channel," Proceedings of IEEE Information Theory Workshop (ITW 2023), Saint-Malo, France, April 23-28, 2023.**
3. **Anjana A. Mahesh and B. S. Rajan, "Minrank of Embedded Index Coding Problems and its Relation to Connectedness of a Bipartite Graph" Proceedings of IEEE Information Theory Workshop (ITW 2022), Mumbai, India, Nov. 2022.**
4. **Anjana A. Mahesh and B. S. Rajan "Space Time Codes in Multi-Antenna Coded Caching Systems" Proceedings of IEEE International Symposium on Information Theory (ISIT 2022), Espoo, Finland, June 26 - July 1, 2022.**
5. **Sreelakshmi P., J. Pachat, Anjana A. Mahesh, Deepthi P.P., and B. S. Rajan. "Index Coded-NOMA in Vehicular Ad Hoc Networks," Proceedings of IEEE 95th Vehicular Technology Conference: VTC2022-Spring, Helsinki, Finland, 19-22 June 2022.**
6. **Anjana A. Mahesh and B. S. Rajan, "A Coded Caching Scheme with Linear Subpacketization and its Application to Multi-Access Coded Caching," Proceedings of IEEE Information Theory Workshop, (ITW), April 11-15, 2021, Riva del Garda, Italy.**
7. **J. Pachat, N. S. Karat, Anjana A. Mahesh, Deepthi P.P. and B. S. Rajan, "Index Coded PSK Modulation in Vehicle to Vehicle Communication," Proceedings of IEEE Vehicular Technology Conference,(2021-Spring), April 2021, Helsinki, Finland.**
8. **Anjana A. Mahesh, N. S. Karat and B. S. Rajan, "Min-rank of Embedded Index Coding Problems," Proceedings of IEEE International Symposium on Information Theory, (ISIT 2020), LA, USA, June 21-26, 2020, pp.1729-1734.**
9. **Anjana A. Mahesh, T. S. Malladi and B. S. Rajan, "Two Private Secure Distributed Coded Computation Schemes Using Extension Fields," Proceedings of IEEE International Conference on Communications, (ICC 2020), Dublin, Ireland, June 07-11, 2020.**
10. **Anjana A. Mahesh and B. S. Rajan, "Index Coded PSK Modulation," Proceedings of IEEE Wireless Communications and Networking Conference, (WCNC 2016), Doha, Qatar, 03-06 April 2016, pp. 1890-1896.**

Manuscripts under review

1. **Anjana A. Mahesh, C. Rajput, B. Rupa, and B. S. Rajan, "Average Probability of Error of Single Uniprior Index Coding Problems over Binary Input Continuous Output Channels", under review in IEEE Transactions on Information Theory.**
2. **N. Saxena, Anjana A. Mahesh, and B. S. Rajan, "An Optimal Two-Step Decoding for PSK-Modulated Noisy Index Coding", under review in IEEE Transactions on Communications.**

Manuscripts under preparation

1. **Anjana A. Mahesh, and B. S. Rajan, "Multi-symbol Multi-level-Modulated Transmissions for Single Unicast Index Coding Problems", manuscript under preparation.**

REFERENCE

- Prof. B. Sundar Rajan,
Department of Electrical and Communication Engineering,
Indian Institute of Science (IISc), Bengaluru, India.
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