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Assistant Professor
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EDUCATION

- **College of Engineering, Trivandrum** Kerala, India
Bachelor of Technology in Electronics & Communication Engineering 1998 – 2002
Percentage: 75.3%
- **Indian Institute of Science** Bangalore, India
Master of Science (Engineering) in Telecommunication 2006 – 2008
GPA: 7.3/8
Thesis: Diversity–Multiplexing Gain tradeoff of Cooperative Multi–hop Networks
Advisor: P. Vijay Kumar
- **Indian Institute of Science** Bangalore, India
Ph. D. 2011 – 2016
Course–work GPA: 7.5/8
Thesis: High-rate MSR Codes, Interior-point Regenerating Codes, and Codes with Hierarchical Locality
Advisor: P. Vijay Kumar

EMPLOYMENT HISTORY

- **Government Engineering College, Barton Hill, Trivandrum** Kerala, India
Assistant Professor May-Jul 2011, 2016 – ongoing
 - **Courses:** Taught undergraduate-level courses Digital Communication (Spring 2020, Spring 2017), Pattern Recognition (Fall 2020, Fall 2019), Analog Communication (Spring 2019), Information Theory and Coding (Fall 2018), Signals and Systems (Spring 2018). Taught graduate-level courses Secure Communication (Fall 2020), Advanced Digital Communication (Fall 2019, Fall 2016), and Random processes and applications (Fall 2018, Fall 2017).
 - **Other Professional Activities:** Working closely with IEEE Kerala section activities. Serving as IEEE student branch counsellor. Organized two editions of Trivandrum School on Communication, Coding and Networking in 2017 and in 2020. Working as a member of Board of Studies, APJ Abdul Kalam Technological University.
 - **Research Collaborations:** Have been collaborating with (a) P. Vijay Kumar, Indian Institute of Science on codes for distributed storage; (b) Vineeth B. S., Indian Institute of Space Science and Technology (IIST) on throughput enhancement in slotted wireless IoT networks; (c) Anoop Thomas, Indian Institute of Technology (IIT), Bhubaneswar on distributed learning (d) faculty members from International Institute of Information Technology (IIIT), Hyderabad on codes with locality; (e) Vinodh Kanakadass, NXP Semiconductors, Bangalore on vehicular radars for 6G.
- **Government Engineering College, Kannur** Kerala, India
Lecturer Jun 2008 – Apr 2011
 - **Courses:** Taught undergraduate-level courses Digital Signal Processing (Spring 2011, Spring 2010), Data compression (Fall 2010), Digital Communication (Fall 2009), Computer Communication Networks (Spring 2009), Network theory (Fall 2008).
- **Infosys Technologies Ltd.** Chennai, India/Dallas, Texas, USA
Program Analyst 2002 – 2006
 - **Verizon Project:** The introduction of modified DSL products and Fiber-to-home products in Verizon led to various changes in the existing workflow. Worked in a team that was involved in developing and modifying various related software components.
 - **Mapquest Project:** Worked in a team developing a smart advertisement platform that learns user behaviour and displays suitable advertisements when users request for maps.

- **NetApp Advanced Technology Group** Bangalore, India
Research Intern 2013
 - **Implementation and Evaluation of MBR codes in Hadoop:** The maximum rate of a minimum-bandwidth regenerating (MBR) code is limited by $1/2$, and therefore many MBR coding schemes allow double replication of data. Such schemes are very well suited in MapReduce framework in which two map jobs can be executed on the same data block simultaneously. We evaluated the performance of these schemes and compared it against the typical triple replication scheme in Hadoop. The work is published in 2014 Usenix Hotstorage conference.
- **NetApp Advanced Technology Group** Bangalore, India
Research Intern 2015
 - **Implementation and Evaluation of Clay Codes in Ceph:** Clay (short for Coupled-Layer) codes are minimum-storage regenerating (MSR) codes that offer a simplified construction for decoding/repair. While we designed the code fully in IISc, we later took up its practical implementation as a separate project in collaboration with NetApp. This turned out to be the first implementation of an MSR code that is simultaneously optimal in many parameters – repair bandwidth, sub-packetization level and disk I/O. The work was published in 2018 Usenix FAST, and received wide recognition.

SELECTED LIST OF PUBLICATIONS

- **Journal submissions awaiting reviews/in preparation:**
 1. B. Sasidharan, A. Thomas, “Coded Gradient Aggregation: A Tradeoff Between Communication Costs at Edge Nodes and at Helper Nodes,” submitted in IEEE Journal on Selected Areas in Communications (Private Information Retrieval, Private Coded Computing over Distributed Servers, and Privacy in Distributed Learning)
 2. B. Sasidharan, G. K. Agarwal and P. Vijay Kumar, “Codes With Hierarchical Locality.” arXiv preprint (arXiv:1501.06683)
- **Book Chapters:**
 1. V. Ramkumar, M. Vajha, S. B. Balaji, M. N. Krishnan, B. Sasidharan, and P. V. Kumar, “Codes for distributed storage,” (Available at arXiv:2010.01344). A chapter in “Concise Encyclopedia of Coding Theory,” 1st edition (2021) edited by W. C. Huffman, J.-L. Kim, and P. Solé and published by Chapman and Hall/CRC.
- **Journals:**
 1. B. Sasidharan, N. Prakash, M. N. Krishnan, M. Vajha, K. Senthooor and P. V. Kumar, “Outer Bounds on the Storage-Repair Bandwidth Tradeoff of Exact-Repair Regenerating Codes,” International Journal of Information and Coding Theory (Special Issue on Information and Coding Theory for Data Storage), vol. 3, pp. 255-298, 2016.
 2. C. Tian, B. Sasidharan, V. Aggarwal, V. A. Vaishampayan, and P. V. Kumar, Layered Exact-Repair Regenerating Codes via Embedded Error Correction and Block Designs, IEEE Trans. Information Theory, pp. 1933-1947, Apr. 2015.
 3. K. Sreeram, B. Sasidharan, P. Vijay Kumar, “DMT of Parallel-Path and Layered Networks under the Half-Duplex Constraint,” *IEEE Transactions on Information Theory*, accepted, 2012.
 4. K. Sreeram, B. Sasidharan, P. Vijay Kumar, “DMT of Multihop Networks: End Points and Computational Tools,” *IEEE Transactions on Information Theory*, vol. 58, no. 02, pages. 804-819, Feb 2012.
 5. S. B. Balaji, M. N. Krishnan, M. Vajha, V. Ramkumar, B. Sasidharan, P. V. Kumar, “Erasure coding for distributed storage: An overview,” Science China Information Sciences, vol. 61, no. 10, pp 100301, Oct 2018.
- **Conferences:**
 1. B. Sasidharan, E. Viterbo, “Private Data Access in Blockchain Systems Employing Coded Sharding,” Accepted for publication in IEEE Symposium on Information Theory (ISIT) 2021, Melbourne.
 2. B. Sasidharan, A. Thomas, “Coded Gradient Aggregation: A Tradeoff Between Communication Costs at Edge Nodes and at Helper Nodes,” Accepted for publication in IEEE Symposium on Information Theory (ISIT) 2021, Melbourne.
 3. D. Shivakrishna, V. A. Rameshwar, V. Lalitha, B. Sasidharan, “On Maximally Recoverable Codes for Product Topologies,” National Conference on Communications (NCC 2018), IIT Hyderabad, 2018.

4. M. Vajha, V. Ramkumar, B. Puranik, G. Kini, E. Lobo, B. Sasidharan, P. Vijay Kumar, A. Barg, M. Ye, S. Narayanamurthy, S. Hussain, S. Nandi, "Clay Codes: Moulding MDS Codes to Yield an MSR Code," pp. 139–154, 16th USENIX Conference on File and Storage Technologies (FAST) 2018.
5. B. Sasidharan, G. K. Agarwal, P. V. Kumar, "Codes with hierarchical locality," IEEE Symposium on Information Theory (ISIT) 2015, Hong Kong.
6. B. Sasidharan, G. K. Agarwal, P. V. Kumar, "A High-Rate MSR Code With Polynomial Sub-Packetization Level," IEEE Symposium on Information Theory (ISIT) 2015, Hong Kong.
7. K. Senthooor, B. Sasidharan, P. V. Kumar, "Improved layered regenerating codes characterizing the exact-repair storage-repair bandwidth tradeoff for certain parameter sets," IEEE Information Theory Workshop, 2015, Jerusalem.
8. G. K. Agarwal, B. Sasidharan, P. V. Kumar, "An Alternate Construction of an Access-Optimal Regenerating Code with Optimal Sub-Packetization Level," National Conference on Communications (NCC 2015), IIT Bombay, 2015.
9. B. Sasidharan, K. Senthooor, and P. V. Kumar, "An improved outer bound on the storage-repair-bandwidth tradeoff of exact-repair regenerating codes," IEEE Symposium on Information Theory (ISIT) 2014, Honolulu.
10. M. N. Krishnan, N. Prakash, V. Lalitha, B. Sasidharan, P. Vijay Kumar, S. Narayanamurthy, R. Kumar, S. Nandi, "Evaluation of codes with inherent double replication for hadoop," 6th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage) 2014.
11. B. Sasidharan, P. V. Kumar, "High-rate regenerating codes through layering," IEEE Symposium on Information Theory (ISIT) 2013, Istanbul.
12. B. Sasidharan, P. V. Kumar, "On the interior points of the storage-repair bandwidth tradeoff of regenerating codes," Allerton Conference on Communication, Control, and Computing, UIUC, 2013.
13. K. Sreeram, B. Sasidharan, P. V. Kumar, "DMT of multi-hop cooperative networks," *Proc. of Information Theory Workshop*, pages. 1-4, Cairo, Jan., 2010.
14. K. Sreeram, B. Sasidharan, P. Vijay Kumar, "Multi-hop Cooperative Wireless Networks: Diversity Multiplexing Tradeoff and Optimal Code Design," *Proc. of the Information Theory and Applications Workshop*, San Diego, Feb., 2008.
15. K. Sreeram, B. Sasidharan, P. Vijay Kumar, "Diversity and degrees of freedom of cooperative wireless networks," *Proc. of IEEE International Symposium on Information Theory*, pages. 1253-1257, Toronto, July, 2008.
16. K. Sreeram, B. Sasidharan, P. Vijay Kumar, "DMT of multi-hop cooperative networks - Part I: K-Parallel-Path networks," *Proc. of IEEE International Symposium on Information Theory*, pages. 2076-2080, Toronto, July, 2008.
17. K. Sreeram, B. Sasidharan, P. Vijay Kumar, "DMT of multi-hop cooperative networks - Part II: Layered and multi-antenna networks," *Proc. of IEEE International Symposium on Information Theory*, pages. 2076-2080, Toronto, July, 2008.
18. K. Sreeram, B. Sasidharan, K. Vinodh, M. Anand, P. Vijay Kumar, "On the throughput, DMT and optimal code construction of the K-parallel-path cooperative wireless fading network," *Proc. of Wireless Personal Multimedia Communications*, Jaipur, Dec., 2007.

SELECTED LIST OF COURSES CREDITED

- **Electrical Communication:** Information Theory, Wireless Communication, Multi-user Information Theory, Detection and Estimation Theory, Error Control Codes, Space-time Codes, Advanced Topics in Coding Theory
- **Mathematics and Computer Science:** Linear Algebra, Probability, Algebra, Real Analysis, Graph theory and Combinatorics

ACHIEVEMENTS, INVOLVEMENTS AND OTHER REMARKS

- Awarded TCS Research Fellowship during Ph. D.
- The coupled-layer code is included as a plugin in Ceph, a popular distributed storage platform.
- Awarded for the best talk in 2016 EECS divisional symposium in IISc that host presentations of Ph. D. theses by students.
- Worked as part of the project on Covid-19 epidemic modeling, projections and action-proposals initiated by Kerala State Disaster Management Authority, for the state of Kerala, India.

- Actively involved as volunteer in the organization of Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-17) in Bangalore 2007, and 2015 IEEE International Symposium on Information Theory Hong Kong.
- Reviewed papers for IEEE Transactions on Information Theory, IEEE Transactions on Wireless Communications, IEEE JSAC Special Issue for “Theories and Methods for Advanced Wireless Relays”, and various conferences including ISIT, ITW, Workshop on Coding and Cryptography, SPCOM.
- Organized a series of evening student seminars titled WINE (Wireless NETWORKS) in IISc along with Dr. Rajesh Sundaresan during 2007-2008.
- Got selected and participated in 2015 Croucher Summer Course in Information Theory, CUHK, Hong Kong.
- Got selected and participated in 2015 Workshop on Coding for Emerging Memories and Storage Technologies held at Technion, Israel.
- Regular participant in annual JTG/IEEE ITSoc Summer School in Information Theory, Signal Processing, Telecommunication, and Networking since 2013.
- Serves as IEEE Student Branch Counselor, Coordinator for NBA Accreditation in Govt. Engineering College, Barton Hill
- Serves as Member, Board of studies, Electronics and Communication Engineering in A. P. J. Abdul Kalam Technological University.