

Education	University of California Los Angeles	<i>Jun '20 - Present</i>
	<i>Ph.D. in Electrical and Computer Engineering</i>	GPA: 4/4
	Interests: Coding techniques for blockchain and data storage systems Information Theory, Wireless communication, Optimization	
	<ul style="list-style-type: none"> Research Assistant in Laboratory for Robust Information Systems, UCLA Advancement to candidacy: March 1st, 2021 	
	University of California Los Angeles	<i>Sept '18 - Jun '20</i>
	<i>M.S. in Electrical and Computer Engineering</i>	GPA: 4/4
	<ul style="list-style-type: none"> Recipient of the 2019-2020 Distinguished Masters Thesis Award in Signals and Systems 	
	Indian Institute of Technology Bombay	<i>Jul '14 - Apr '18</i>
	<i>Bachelor of Technology (with Honors) in Electrical Engineering</i>	CGPA: 9.15/10
	<ul style="list-style-type: none"> Minor degree in Computer Science and Engineering 	
	Publications	
	<i>Preprints</i>	
	<ul style="list-style-type: none"> Debarnab Mitra, Lev Tauz, and Lara Dolecek, “Overcoming Data Availability Attacks in Blockchain Systems: LDPC Code Design for Coded Merkle Tree”, submitted to IEEE Transactions on Communications. (Preprint Link) 	
	<i>Conference Papers Published</i>	
	<ul style="list-style-type: none"> Debarnab Mitra, Lev Tauz, and Lara Dolecek, “Communication-Efficient LDPC Code Design for Data Availability Oracle in Side Blockchains”, to appear in ITW 2021. (Preprint Link) Debarnab Mitra, Lev Tauz, and Lara Dolecek, “Concentrated Stopping Set Design for Coded Merkle Tree: Improving Security Against Data Availability Attacks in Blockchain Systems”, ITW 2020. (Paper Link) Debarnab Mitra and Lara Dolecek, “Patterned Erasure Correcting Codes for Low Storage-Overhead Blockchain Systems”, ACSSC 2019. (Paper Link) Debarnab Mitra, Himanshu Asnani, Sibi Raj B. Pillai, “On the Sum-capacity of Compound MAC Models with Distributed CSI and Unknown Fading Statistics”, CISS 2019. (Paper Link) 	
	Patents	
	<i>Patent Applications Filed</i>	
	<ul style="list-style-type: none"> Debarnab Mitra, Zion S. Kwok, and Ravi H. Motwani, “Dynamic Self-Correction of Message Reliability in LDPC Codes,” US Patent App. 17/171430, filed Feb. 9, 2021. (Application) Debarnab Mitra, Santhosh K. Vanaparthi, “Hybrid LDPC Decoder with Mixed Precision Components,” US Patent App. 17/183223, filed Feb. 23, 2021. (Application) 	
	Employment History	
	Graduate Student Researcher , LORIS Lab, UCLA	<i>Sept '19 - Present</i>
	<i>Guide: Prof. Lara Dolecek, UCLA</i>	
	Project: Channel coding for Blockchain systems	
	<ul style="list-style-type: none"> Proposed novel concentrated LDPC code design techniques to improve security against adversarial data availability attacks pertinent to blockchain systems which run light clients Designed communication efficient LDPC codes for data availability oracles in side blockchains Developed codes that leverage patterned structure of node failures and minimally corrects only a given patterned erasure set to reduce the storage overhead in blockchain systems 	
	Intel Corporation , Santa Clara, CA	<i>Summer '20</i>
	<i>ECC Design Intern, Non Volatile Memory Solutions Group</i>	
	<ul style="list-style-type: none"> Proposed low cost techniques to improve the performance of NB-LDPC decoders tailored for 3DXP and 3D NAND products. The work resulted in filing two patents applications. 	
	Intel Corporation , Santa Clara, CA	<i>Summer '19</i>
	<i>ECC Design Intern, Non Volatile Memory Solutions Group</i>	
	<ul style="list-style-type: none"> Identified potential solutions to improve the FER of existing LDPC decoders from literature Investigated convex optimization based LDPC decoders to improve the error floor performance compared to the BP decoder to be used in Intel's Optane product Worked on deep learning based methods to improve FER performance (especially in the error floor region) of Min-Sum decoders using Tensorflow 	
	Undergraduate Student Researcher , IIT Bombay, India	<i>Jul '17 - Jun '18</i>
	<i>Guide: Prof. Sibi Raj B Pillai, IIT Bombay</i>	
	Project: Sum capacity of Compound-MACs with distributed CSI	
	<ul style="list-style-type: none"> Derived the sum-capacity for symmetric Compound-MACs with distributed CSI at encoders 	

- Designed an algorithm to find the optimal single-user power control law in this channel

Schneider Electric, Bangalore, IN

Summer '17

Systems Engineering Intern, APS group

- Developed loss model for a TOPSwitch flyback AC-DC converter (98% accuracy)
- Designed a multiple output AC-DC converter with features like line over voltage /under voltage (OV/UV) protection, output over voltage protection (OVP) and snubber circuit

Equipminds Solutions, Mumbai, IN

Summer '16

- Designed and implemented algorithms for a plan engine to generate adaptive study plans for students preparing for various engineering examinations in India

Teaching

ECE 230B: Digital Communication Systems, UCLA

Spring 2020

Instructor: Prof. Greg Pottie, UCLA

ECE 131A: Probability and Statistics, UCLA

Winter 2020, Winter 2021

Instructor: Prof. Lara Dolecek, UCLA

Honors and Awards

Fellowships and Academic awards

- Won the Best Poster Award at the [IEEE North American School of Information Theory](#) *Jun '21*
- Recipient of the Distinguished Masters Thesis Award in Signals and Systems, UCLA *2019-2020*
- Recipient of the Guru Krupa Fellowship by ECE department, UCLA *2019-20, 2020-21*
- Received honorarium award by IIT Bombay for exemplary work done towards the project titled “*Non Linear Junction Detector*” *Apr '16*
- All India Rank 168 in [JEE Advanced](#) '14 (*out of 126,000 candidates*) *2014*
- All India Rank 272 in [JEE Mains](#) '14 (*out of 1,400,000 candidates*) *2014*
- Recipient of the [Kishore Vaigyanik Protsahan Yojana](#) (KVPY) fellowship by the Department of Science and Technology, Govt. of India *2013*

Olympiads

- Gold medalist in Regional Mathematics Olympiad '12 (RMO), Odisha, conducted by Homi Bhabha Centre for Science Education (HBSCE), India *2012*
- Among top 75 students in India in [Indian National Mathematical Olympiad](#) '14 conducted by Homi Bhabha Centre for Science Education (HBSCE), India *2014*
- Cleared the [National Standard Exam in Physics](#) '13, [National Standard Exam in Chemistry](#) '13 and [National Standard Exam in Astronomy](#) '13 conducted by IAPT, India, first rounds in selection into Indian teams for respective International Olympiads *2013*

Relevant Courses

UCLA

- Mathematical Foundations of Data Storage Systems (**A+**), Linear Programming (**A+**), Information Theory, Convex Optimization (**A+**), Digital Speech Processing (**A+**), Optimization methods for Large scale systems, Wireless Communications System Design (**A+**), Computational Imaging, Advanced Speech Processing, Large Sample Theory (**A+**), Combinatorial Theory, Reinforcement Learning Theory and Applications (audit)

IIT Bombay

- **EE**: Error Correcting Codes, Wireless and Mobile Communication, Digital Communications, Communication Systems, Digital Signal Processing, Signals and Systems, Network Theory
- **CS**: Foundations of Machine Learning, Computer Networks, Computer and Network security, Data & Structures Algorithms, Design & Analysis of Algorithms, Operating Systems
- **MA**: Probability and Random Processes, Number Theory and Cryptography, Linear Algebra, Discrete Structures, Complex Analysis, Calculus, Differential Equations

Technical Skills

Languages: Python, C++, Bash, Embedded C, PHP, SQL, VHDL, ASSEMBLY

Tools and packages: MATLAB, Tensorflow, Anaconda, Scilab, Android Studio, SAGEMATH

Simulation & Design: GNURadio, Keil IDE, Altera Quartus, Modelsim, Vivado HLS