

SHRUTI HIRAY

CONTACT INFORMATION	Department of Electrical Engineering Indian Institute of Technology Bombay Citizenship status: Indian	Phone: +91-9167851903 Email: shruti_hiray@iitb.ac.in Homepage: shrutihiray.github.io
EDUCATION	Indian Institute of Technology Bombay , India <i>July 2014 - Present</i> Dual Degree (Bachelor + Master of Technology), Department of Electrical Engineering Master's Specialization: Communications & Signal Processing Minor degree in Computer Science CGPA: 8.51/10	
RESEARCH PROJECTS & INTERNSHIPS	Lightning Network Simulator - Dual Degree Thesis <i>Report</i> Guide: Prof. Saravanan Vijayakumaran <i>Spring 2017 - Present</i> <ul style="list-style-type: none">Studied scalability of Bitcoin blockchain with Lightning Network.Implementing a simulator for multihop payment routing in Haskell and Python.Achieved 98% reachability in the 2000 node network with 4 beacons using Flare. Blockchain Developer at <i>Delta Exchange</i> <i>Spring 2019 - Present</i> <ul style="list-style-type: none">Developing a Bitcoin HD wallet to broadcast transactions on blockchain.Implementing address whitelisting, admin approval in Python. Multisource and Multipath Content Transfer <i>Report</i> Guides: Prof. D. Manjunath & Prof. Nikhil Karamchandani <i>Autumn 2018</i> <ul style="list-style-type: none">Parallel download through Cellular and WiFi from multiple sources.Implemented browser plugin using Javascript & Google Native Client.Implemented Java Cloud Server on AWS with Apache and C++ Server on OpenWrt Operating system installed on WiFi access points.Parts of file downloaded from cache in WiFi access points reduces network congestion considerably and increases throughput. Summer Risk Analyst at <i>American Express</i> <i>Summer 2017</i> <ul style="list-style-type: none">Built dynamic pricing engine for Membership Rewards using Gradient Boost in SQL & Hadoop.Used customer analytics data to personalize the offers to customers.Achieved 80% accuracy of prediction of expected points redeemed by customer.Received pre-placement offer for remarkable work in the internship. Android Application Developer at <i>Carsense</i> <i>Summer 2016</i> <ul style="list-style-type: none">Developed APIs for data sync with hardware device via BLE communication.Analyzed user activity with CleverTap and crashes with Crashlytics.Developed JUnit Test Cases using Espresso Test Framework to test the app features on various mobile devices present in Google Cloud Testing Lab.	
TEACHING ASSISTANTSHIP	EE720: Number Theory & Cryptography EE308: Communication Systems	Prof. Saravanan Vijayakumaran Prof. S. N. Merchant
RESEARCH INTERESTS	My research interest lies in Blockchain & Cryptocurrency Technologies, Cryptography, Security .	

KEY ACADEMIC PROJECTS	Algorand Simulator <i>Spring 2019</i> <ul style="list-style-type: none"> Discrete event simulator of Algorand using Gossip, Cryptographic sortition. Tested for Fail-Stop adversary, Byzantine adversary.
	Optimal Relay Node Placement <i>Spring 2018</i> <ul style="list-style-type: none"> Implemented relay node placement in LTE-A Cellular Systems Jointly optimized for downlink and uplink for coverage extension.
	Speech Watermarking <i>Autumn 2017</i> <ul style="list-style-type: none"> Developed watermark extraction algorithm for proving ownership, tampering. Implemented using Autoregressive model & Psychoacoustic model.
	Automatic Speech Recognition system <i>Autumn 2017</i> <ul style="list-style-type: none"> Classified speech signals of spoken numerical digits using labelled data. Used Cepstrum, K-means clustering, Dynamic time warping.
	Voice Morphing using Linear Prediction <i>Spring 2017</i> <ul style="list-style-type: none"> The information in speech of one speaker is morphed in the voice of another. Used source-filter model, linear prediction and pre-emphasis in phonemes. Selected in the top 4 projects among 30 projects.
RELATED COURSEWORK	Microprocessor Design <i>Autumn 2016</i> <ul style="list-style-type: none"> Designed a 16 bit - 8 register RISC computer system of 14 instructions. A 6 staged pipeline processor with hazard mitigation using data-forwarding.
	Computer Science: Blockchain Technology, Number Theory & Cryptography, Network Security, Data Structures & Algorithm, Computer Networks, Discrete Structures, Operating Systems, Machine Learning, Computer Graphics
	Electrical: Error Correcting Codes, Speech Processing, Wireless Communications, Advanced Communication Networks, Advanced Signal Processing, Microprocessors
TECHNICAL SKILLS	Others: Probability, Data Analysis, Economics.
	Programming Languages: Python, C/C++, Java, Haskell, Assembly Language, VHDL, SQL
	Development Tools: PRAAT, MATLAB, Scilab, \LaTeX 2 _ε , Github, ngSpice, Arduino, Android Studio, AutoCAD
POSITIONS OF RESPONSIBILITY	Technical Councilor of <i>Hostel 10, IIT Bombay</i> <i>2016-2017</i> Organized telescope, microscope handling workshops, virtual reality session. Spread awareness of Women In Tech , managed technical general championships.
	Institute Convener of <i>Robotics Club, IIT Bombay</i> <i>2015-2016</i> Organized inter-hostel robotics events, industrial visits and guest lectures. Mentored technical activities, played a key role in creating robotics community .
EXTRA CURRICULAR ACTIVITIES	<ul style="list-style-type: none"> Completed a basic certified course in Spanish language. Performed Maharashtra Folk dance in Institute Classical & Folk Arts Night. Secured 2nd position in Freshiezza Group Dance Competition. Completed a course in Lawn Tennis under National Sports Organization. Secured Bronze medal in Institute Carom General Championship.