

CONTACT INFORMATION	Department of Electrical Engineering (EE) Caltech Paradise Lab, Moore 311, MC 136-93, Caltech Pasadena, CA, 91125, USA	<i>Cell:</i> +1 626-652-1958 <i>E-mail:</i> <a href="mailto:sidjain@caltech.edu">sidjain@caltech.edu</a> <i>Web:</i> <a href="http://paradise.caltech.edu/~sidjain">paradise.caltech.edu/~sidjain</a>
POSITIONS	<b>California Institute of Technology</b> <i>Research Scientist, Electrical Engineering</i> <span style="float: right;"><i>Jan 2021 - present</i></span> <b>California Institute of Technology</b> <i>Postdoctoral Researcher, Electrical Engineering</i> <span style="float: right;"><i>July 2019 - Dec 2020</i></span>	
EDUCATION	<b>California Institute of Technology</b> <i>PhD, Electrical Engineering ; GPA 4.1/4</i> <i>PhD Thesis Title: Decoding the Past</i> <b>Indian Institute of Technology Kanpur</b> <i>B. Tech and M. Tech in Electrical Engineering</i> <i>GPA: B. Tech 9.9/10, M. Tech 10/10</i>	Advisor: Prof. Jehoshua Bruck <i>Sept. 2013 - June 2019</i>  Advisor: Prof. R. K. Bansal <i>2008 - 2013</i>
ACADEMIC ACHIEVEMENTS	<ul style="list-style-type: none"> <li>• Selected for giving <b>Graduation Day Talk at Information Theory and Applications</b> meeting in San Diego in 2019 amongst all CS and EE graduate students at Caltech.</li> <li>• <b>General Proficiency Medal</b> for the best academic performance in EE department at IIT Kanpur.</li> <li>• <b>Best paper award</b> at 6th ACM/IEEE International Symposium on Networks-on-Chip (NOCS), 2012.</li> <li>• <b>Academic Excellence Award</b> (awarded to top 5% undergraduates) for all the academic years at IIT Kanpur. (2008-2012)</li> </ul>	
PATENT	<b>Siddharth Jain</b> , Bijan Mazaheri, Netanel Raviv, Jehoshua Bruck <i>Mutation Profile and related labeled Genomic Components, Methods and Systems</i> December 2019, US Patent App. 16/447,162.	
PUBLICATIONS/ PREPRINTS	<ul style="list-style-type: none"> <li>• Bijan Mazaheri, <b>Siddharth Jain</b>, Jehoshua Bruck <i>Robust Correction of Sampling Bias Using Cumulative Distribution Functions</i> accepted to NeurIPS 2020.</li> <li>• <b>Siddharth Jain</b>, Farzad Farnoud, Moshe Schwartz, Jehoshua Bruck <i>Coding for optimized writing rate in DNA Storage</i> accepted to IEEE International Symposium on Information Theory (ISIT) 2020.</li> <li>• Netanel Raviv, <b>Siddharth Jain</b>, Jehoshua Bruck <i>What is the Value of Data? On Mathematical Methods for Data Quality Estimation</i> accepted to IEEE International Symposium on Information Theory (ISIT) 2020.</li> <li>• Netanel Raviv, <b>Siddharth Jain</b>, Pulakesh Upadhyaya, Jehoshua Bruck, Anxiao Jiang <i>CodNN: Robust Neural Networks from Coded Classification</i> accepted to IEEE International Symposium on Information Theory (ISIT) 2020.</li> <li>• Netanel Raviv, Pulakesh Upadhyaya, <b>Siddharth Jain</b>, Jehoshua Bruck, Anxiao Jiang <i>Coded Deep Neural Networks for Robust Neural Computation</i> accepted in NVMW 2020.</li> </ul>	

- Bijan Mazaheri, **Siddharth Jain**, Jehoshua Bruck  
*Synthesizing New Expertise via Collaboration*  
submitted.
- **Siddharth Jain**, Xiongye Xiao, Paul Bogdan, Jehoshua Bruck  
*Predicting the Emergence of SARS-CoV-2 Clades*, BiorXiv:2020.07.26.222117.
- **Siddharth Jain**, Bijan Mazaheri, Netanel Raviv, Jehoshua Bruck  
*Cancer Classification from Healthy DNA*, BiorXiv:517839
- **Siddharth Jain**, Bijan Mazaheri, Netanel Raviv, Jehoshua Bruck  
*Short Tandem Repeats Information in TCGA is Statistically Biased by Amplification*, BiorXiv:518878
- **Siddharth Jain**, Netanel Raviv, Jehoshua Bruck  
*Attaining the 2nd Chargaff Rule by Tandem Duplications*  
in Proceedings of IEEE International Symposium on Information Theory (ISIT), pp. 2241-2245, Vail, Colorado, June 2018.
- **Siddharth Jain**, Farzad Farnoud, Jehoshua Bruck  
*Capacity and Expressiveness of Genomic Tandem Duplication*.  
IEEE Transactions on Information Theory, vol 63, no 10, pp. 1629-1638, October 2017.
- **Siddharth Jain**, Farzad Farnoud, Moshe Schwartz, Jehoshua Bruck  
*Duplication Correcting Codes for Data Storage in the DNA of a living organism*  
IEEE Transactions on Information Theory, vol 63, no 8, pp. 4996-5010, August 2017.
- Noga Alon\*, Jehoshua Bruck\*, Farzad Farnoud\*, **Siddharth Jain\***  
*Duplication Distance to the root for binary sequences*.  
IEEE Transactions on Information Theory, vol 63, no 12, pp. 7793-7803, December 2017  
(\*author list in alphabetical order).
- **Siddharth Jain**, F. Farnoud, M. Schwartz, J. Bruck  
*Noise and Uncertainty in String-Duplication Systems*  
in Proceedings of IEEE International Symposium on Information Theory (ISIT), pp. 3120-3124, Aachen, Germany, June 2017.
- **Siddharth Jain**, R. K. Bansal  
*On Match Lengths, Zero Entropy and Large Deviations - with Application to Sliding Window Lempel-Ziv Algorithm*.  
IEEE Transactions on Information Theory, vol. 61, no. 1, pp. 120-132, January 2015.
- Paul Bogdan, **Siddharth Jain**, Radu Marculescu  
*Pacemaker Control of Heart Rate Variability: A CPS Perspective*.  
ACM Transactions on Embedded and Computing Systems (TECS), vol. 12, no. 1s, article 50, March 2013.
- Paul Bogdan, Radu Marculescu, **Siddharth Jain**  
*Dynamic Power Management for Multi-domain Processor Systems-on-Chip Platforms: An Optimal Control Approach*.  
ACM Transactions on Design Automation of Electronic Systems (TODAES), vol. 18, no. 4, article 46, October 2013.
- Paul Bogdan, Radu Marculescu, **Siddharth Jain**, Rafael Tornero  
*Optimal Power Management of Multidomain Multiprocessor Platforms under Highly Variable Workloads*.  
Proceedings of the 6th ACM/IEEE International Symposium on Networks-on-Chip (NOCS), pp. 35-42, Copenhagen, Denmark, May 2012 (**Best Paper Award**).
- Paul Bogdan, **Siddharth Jain**, Kartikeya Goyal, Radu Marculescu  
*Implantable Pacemakers Control and Optimization via Fractional Calculus Approaches: A Cyber-Physical Systems Perspective*.  
Proceedings of the ACM/IEEE 3rd International Conference on Cyber-Physical Systems (IC-CPS), pp. 23-32, Beijing, China, April 2012.

## Recent Workshops

1. Netanel Raviv, **Siddharth Jain**, Jehoshua Bruck  
*What is the Value of Data? On Mathematical Methods for Data Quality Estimation*, CodML Workshop at ICML 2019.
2. **Siddharth Jain**, Bijan Mazaheri, Netanel Raviv, Jehoshua Bruck  
*A Novel Signature for Cancer Classification from Healthy DNA*, LMRL workshop at NeurIPS 2019.

RELEVANT COURSES *Statistical Inference, Information Theory, Learning Systems, Machine Learning and Data Mining, Probability and Statistics, Error Correcting Codes, Theory of Computation, Data Structures and Algorithms, Randomized Algorithms, Digital Signal Processing, Stochastic Processes, Markov Chains, Real and Complex Analysis, Differential Equations, Control System Analysis, Linear Estimation, Combinatorics.*

PROFESSIONAL ACTIVITIES Reviewer for IEEE Transactions on Information Theory, IEEE Communication Letters, ACM Transactions on Algorithms, Frontiers in Physiology, International Symposium on Information Theory, AAAS Science Advances.

MENTORSHIP

1. Bijan Mazaheri - 4th year CMS PhD student at Caltech.
2. Xiongye Xiao - 2nd year ECE PhD student at USC.

INVITED TALKS

1. *Decoding the Past.*  
Information Theory and Application Graduation day, San Diego, Feb 2019.
2. *Duplication Channel of the Genome.*  
Conference on Information Sciences and Systems, John Hopkins University, March 2019.
3. *Decoding the Past.*  
Molecular Programming Project (MPP) Workshop, Boston, Massachusetts, December 2016.
4. *Biological Information Channel.*  
IPAM Computational Genomics Summer Institute (CGSI), UCLA, July 2016.
5. *Duplication Correcting Codes for DNA Storage.*  
Molecular Programming Project (MPP) Workshop, Seattle, Washington, January 2016.

POSTERS

1. **Siddharth Jain**, F. Farnoud, M. Schwartz, Jehoshua Bruck  
*Capacity and Diversity of Tandem Duplication.*  
Molecular Programming Project (MPP) Workshop, Jan 9-11, 2015, San Francisco California.  
*[Invited]*

TECHNICAL SKILLS **Programming Languages:** Python, C++, Matlab  
**Machine Learning Libraries:** xgboost, sklearn

POSITION OF RESPONSIBILITY

1. Head TA for IST4 (Spring 2015, 2016, 2017, 2018, 2019)  
- An Information and Logic class offered to undergraduates at Caltech by Prof. Shuki Bruck
2. TA for EE111 (Fall 2018)  
- Signal Processing class offered to undergraduates at Caltech by Prof. P. P. Vaidyanathan

3. TA for EE621 (Aug 2012 - Nov 2012)  
- Stochastic Processes and Measure Theory class offered to graduate students at IIT Kanpur by Prof. R. K. Bansal
4. Treasurer of the Caltech Cricket Club (Sept 2015-present) and the Indian Subcontinent Organization at Caltech (Sept 2014-Aug 2015)
5. Link Student, Counselling Service, IIT Kanpur - Help students who are not doing so well academically at IIT Kanpur.
6. Mentor at National Service Scheme (NSS), India - Tutoring 6th-8th grade students in villages of India.