

HIMANSHU ASNANI

Indian Citizen

Website : www.himanshuasnani.com

Email : himanshu.asnani@tifr.res.in, asnani@uw.edu

(updated July 23, 2022)

WORK EXPERIENCE

- **TATA INSTITUTE OF FUNDAMENTAL RESEARCH** Sept '19 - Present
Reader (*eq. to tenure-track Assistant Professor*, STCS (on leave since Jan '22)) Mumbai, India
- **UNIVERSITY OF WASHINGTON** July '18 - June '22
Affiliate Assistant Professor, Electrical and Computer Engineering Department Seattle, WA
- **UNIVERSITY OF WASHINGTON** Feb '18 - June '19
Research Associate, Electrical and Computer Engineering Department Seattle, WA
- **IIT BOMBAY** Mar '17 - Mar '19
Visiting Assistant Professor, Electrical Engineering Department Mumbai, India
- **STANFORD UNIVERSITY** June '16 - August '16
Lecturer, Electrical Engineering Department Stanford, CA
- **SHIKHYA** Jan '18 - Dec '21
Founding Advisor Cupertino, CA
- **SHIKHYA** Jan '16 - Dec '17
Co-Founder & CEO Cupertino, CA
- **ERICSSON R&D** April '14 - Feb '16
System Architect, DUIB IP Routers System & Technology San Jose, CA
- **ERICSSON R&D** June '13 - Sept '13
Engineering Intern, DUIB IP Routers System & Technology San Jose, CA

EDUCATION

- **STANFORD UNIVERSITY** Stanford, CA
Ph.D., Electrical Engineering Winter 2010 - Winter 2014
– GPA : 4.139 (Advisor : Prof. Tsachy Weissman)
- **STANFORD UNIVERSITY** Stanford, CA
M.S. in Electrical Engineering Fall 2009 - Spring 2011
– GPA : 4.046
- **INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY** Mumbai, India
B. Tech., Electrical Engineering Aug. 2005 - May 2009
– CGPA : 9.54/10 (Department Rank 4, Institute Rank 6)

RESEARCH INTERESTS

- Information and Coding Theory
- Statistical Estimation and Inference
- Machine Learning

ACADEMIC ACHIEVEMENTS

- Ranked 4th in IIT-JEE Main Examination and 1st in IIT-JEE Screening Examination 2005 all over India.
- **Bronze Medalist** at the 37th International Chemistry Olympiad (IChO) 2005, Taipei, Taiwan.
- **Gold Medalist** in Indian National Physics Olympiad (2005) and Indian National Chemistry Olympiad (2005).
- Ranked 1st in National Science Olympiad 2004 and 2005 all over India.

AWARDS AND SCHOLARSHIPS

- Named **Amazon Catalyst Fellow** for the year 2018 for "DeepCode : Inventing Communication Algorithms via Artificial Intelligence".

- Recipient of **Marconi Society Paul Baran Young Scholar Award** for the year 2014, which recognizes individuals who have, at an early age, demonstrated exceptional scientific and entrepreneurial capabilities with the potential to create significant advances in telecommunications and the Internet.
- **ISIT Student Paper Award Finalist** for the year 2011 in *IEEE International Symposium on Information Theory (ISIT)*, Saint Petersburg, Russia.
- Recipient of **Stanford Graduate Fellowship**.
- Awarded **Best Paper Award** for the paper "Scheduling with Limited Information in Wireless Systems" in **MobiHoc 2009**, New Orleans, Louisiana, USA.
- Awarded **Best B.Tech Project Award** for the year 2009 in IIT Bombay.
- Awarded **Bhavesh Gandhi Memorial Award** for Best B.Tech Research Seminar for the year 2008 in IIT Bombay.
- Invited to **First Theoretical Computing Winter School** organized by the *Institute of Theoretical Computer Science and Communications (ITCSC)* at the Chinese University of Hong Kong (CUHK) among 80 undergraduates from Universities in the Mainland China, Hong Kong, Taiwan and India.

BOOK CHAPTERS

- "Relations between Information and Estimation in the presence of Feedback", Himanshu Asnani, Kartik Venkat and Tsachy Weissman, **Invited contribution to Information and Control in Networks, Lecture Notes in Control and Information Sciences**, Volume 450, 2014, pp 157-175, Springer.

PATENTS

- "BNG / Subscriber Management Integrated, FIB Based, Per Subscriber, Opt-in Opt-out, Multi Application Service Chaining Solution via Subscriber Service Chaining NextHop and Meta IP Lookup", Himanshu Asnani, Mustafa Arisoylu, Ramnathan Laxmikanthan and Prashant Anand, **US Patent Office**, Application Number 14/640,452.
- "Method and system for packet redundancy removal", Himanshu Asnani, Ritesh Kolte and Mustafa Arisoylu, **US Patent Office**, Application Number 14/579,987.
- "Method and system for load balancing in a software-defined networking (SDN) system upon server reconfiguration", Himanshu Asnani, Rohit Basaravaja, Myna Vajha, Prashant Anand, Arvind Mukundan and Mustafa Arisoylu, **US Patent Office**, Application Number 14/575,021.

JOURNAL PUBLICATIONS (accepted)

- "Generalized Submodular Information Measures: Theoretical Properties, Examples, Optimization Algorithms, and Applications", Rishabh K. Iyer, Ninad Khargonkar, Jeff A. Bilmes, and Himanshu Asnani, **IEEE Transactions on Information Theory**, Vol. 68, No. 2, pp 752-781, February 2022.
- "Regularized Autoencoders with Flexible Priors for Clustering Single-cell Gene Expression Data", Arnab Kumar Mondal, Parag Singla, Himanshu Asnani and Prathosh A P, **IEEE/ACM Transactions on Computational Biology and Bioinformatics**, Oct. 2021.
- "LEARN Codes : Inventing Low-latency codes via Recurrent Neural Networks", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, and Pramod Viswanath, **IEEE Journal of Selected Areas in Information Theory**, Vol. 1, Issue 1, pp 207-216, May 2020.
- "Deep Learning meets Coding Theory", Sreeram Kannan and Himanshu Asnani, **IEEE India Council Newsletter**, Vol. 14, No. 4, Oct - Dec 2019.
- "Network Compression: Worst-Case Analysis", Himanshu Asnani, Ilan Shomorony, A. Salman Avestimehr, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 61, Issue 7, pp 3980 - 3995, July 2015.
- "Information Embedding on Actions", Behzad Ahmadi, Himanshu Asnani, Osvaldo Simeone and Haim Permuter, **IEEE Transactions on Information Theory**, Vol. 60, Issue 11, pp 6902 - 6916, November 2014.
- "Capacity of a POST Channel with and without Feedback", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 60, Issue 10, pp 2538 - 2542, October 2014.
- "To Feed or Not to Feed Back", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 60, Issue 9, pp 5150 - 5172, September 2014.

- "Successive Refinement with Decoder Cooperation and its Channel Coding Duals", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 59, Issue 9, pp 5511-5533, September 2013.
- "QualComp: a new lossy compressor for quality scores based on rate distortion theory", Idoia Ochoa, Himanshu Asnani, Dinesh Bharadia, Mainak Chowdhury, Tsachy Weissman, and Golan Yona, **BMC Bioinformatics**, 2013, 14:187, June 2013.
- "Multi-Terminal Source Coding with Action Dependent Side Information", Yeow-Khiang Chia, Himanshu Asnani and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 59, Issue 6, pp 3653-3667, June 2013.
- "On Real Time Coding with Limited Lookahead", Himanshu Asnani, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 59, Issue 6, pp 3582-3607, June 2013.
- "Multiple access channel with partial-cribbing encoders", Haim Permuter, and Himanshu Asnani, **IEEE Transactions on Information Theory**, Vol. 59, Issue 4, pp 2252-2266, April 2013.
- "Probing Capacity", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, **IEEE Transactions on Information Theory**, Vol. 57, Issue 11, pp 7317-7332, November 2011..
- "A Potpourri of Fermi Problems", Praveen Pathak, Vijay Singh and Himanshu Asnani. *Published in Resonance*, pg. 58-66, June 2007.
- "Effective mass theory of a two-dimensional quantum dot in the presence of magnetic field", Himanshu Asnani, Raghu Mahajan, Praveen Pathak, and Vijay Singh, **PRAMANA**, Volume 73, Number 3, 573-580.
- "BenDaniel-Duke Boundary Conditions : A Two Dimensional Analysis", Himanshu Asnani, and Biswanath Patel. *Published in Prayas (Students' Journal of Physics)*, Vol. 2, No. 6, pg. 191-194, Nov-Dec 2005.

CONFERENCE PUBLICATIONS (accepted)

- "Rényi Divergence Based Bounds on Generalization Error", Eeshan Modak, Himanshu Asnani and Vinod M. Prabhakaran, **IEEE Information Theory Workshop (ITW)**, October 17-21, 2021, Kanazawa, Japan (virtual).
- "FlexAE: Flexibly Learning Latent Priors for Wasserstein Auto Encoders", Arnab Kumar Mondal, Parag Singla and Prathosh A P, **Conference on Uncertainty in Artificial Intelligence (UAI)**, July 27-29, 2021 (virtual).
- "Independence Properties of Generalized Submodular Information Measures", Himanshu Asnani, Jeff A. Bilmes, and Rishabh Iyer, **IEEE International Symposium on Information Theory (ISIT)**, Melbourne, Victoria, Australia, July 12-20, 2021 (virtual).
- "C-MI-GAN : Estimation of Conditional Mutual Information using MinMax formulation", Arnab Mondal, Arnab Bhattacharjee, Sudipto Mukherjee, Sreeram Kannan, Prathosh AP, and Himanshu Asnani, *to appear in Conference on Uncertainty in Artificial Intelligence*, 2020.
- "MaskAAE: Latent space optimization for Adversarial Auto-Encoders", Arnab Kumar Mondal, Sankalan Pal Chowdhury, Aravind Jayendran, Parag Singla, Himanshu Asnani, and Prathosh AP, *to appear in Conference on Uncertainty in Artificial Intelligence*, 2020.
- "Feedback Turbo Encoder", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sewoong Oh, Sreeram Kannan, and Pramod Viswanath, **21st IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)**, Virtual, May 26-28, 2020.
- "Joint Channel Coding and Modulation via Deep Learning", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh and Pramod Viswanath, **45th International Conference on Acoustics, Speech, and Signal Processing**, Virtual Barcelona, May 4-8, 2020.
- "Turbo Autoencoder: Deep learning based channel code for point-to-point communication channels", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh and Pramod Viswanath, **33rd Conference on Neural Information Processing Systems**, 2019.
- "CCMI : Classifier based Conditional Mutual Information Based Estimation", Sudipto Mukherjee, Himanshu Asnani and Sreeram Kannan, *to appear in Conference on Uncertainty in Artificial Intelligence 2019*, Tel Aviv, Israel, July 23-25, 2019.
- "MIND : Model Independent Neural Decoder", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan *to appear in 20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC) 2019*, Cannes, France, July 2-5, 2019.

- "DEEPTURBO : Deep Turbo Decoder", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, Pramod Viswanath to appear in **20th IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC) 2019**, Cannes, France, July 2-5, 2019.
- "LEARN Codes: Inventing low-latency codes via recurrent neural networks", Yihan Jiang, Hyeji Kim, Himanshu Asnani, Sreeram Kannan, Sewoong Oh, and Pramod Viswanath to appear in **53rd IEEE International Conference on Communications**, Shanghai, China, May 20-24, 2019.
- "On the Sum-capacity of Compound MAC Models with Distributed CSI and Unknown Fading Statistics", Debarbab Mitra, Himanshu Asnani, and Sibi Raj B. Pillai to appear in **53rd Annual Conference on Information Systems & Sciences**, John Hopkins University, Baltimore, Maryland, USA, March 20-22, 2019.
- "ClusterGAN : Latent Space Clustering in Generative Adversarial Networks", Sudipto Mukherjee, Himanshu Asnani, Eugene Lin, and Sreeram Kannan, to appear in **Thirty-third AAAI Conference on Artificial Intelligence**, Honolulu, Hawaii, USA, January 27 - February 1, 2019 [Link : <https://arxiv.org/abs/1809.03627>].
- "Estimators for Multivariate Information Measures in Generative Probability Spaces", Arman Rahimzamani, Himanshu Asnani, Pramod Viswanath, and Sreeram Kannan, to appear in **Advances in Neural Information Processing Systems 31**, 2018 [Link : <https://arxiv.org/abs/1810.11551>].
- "Operational extremality of Gaussianity in network compression, communication, and coding", Himanshu Asnani, Ilan Shomorony, A. Salman Avestimehr, and Tsachy Weissman, in **IEEE Information Theory Workshop (ITW)**, Sevilla, Spain, September 9-13, 2013.
- "Network Compression: Worst-Case Analysis", Himanshu Asnani, Ilan Shomorony, A. Salman Avestimehr and Tsachy Weissman, in **IEEE International Symposium on Information Theory (ISIT)**, Istanbul, Turkey, July 7-12, 2013.
- "Information Embedding on Actions", Behzad Ahmadi, Himanshu Asnani, Osvaldo Simeone, and Haim Permuter, in **IEEE International Symposium on Information Theory (ISIT)**, Istanbul, Turkey, July 7-12, 2013.
- "Capacity of a POST Channel with and without Feedback", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, in **IEEE International Symposium on Information Theory (ISIT)**, Istanbul, Turkey, July 7-12, 2013.
- "Worst-Case Source for Distributed Compression with Quadratic Distortion", Ilan Shomorony, A. Salman Avestimehr, Himanshu Asnani, and Tsachy Weissman, in **IEEE Information Theory Workshop (ITW)**, EPFL, Lausanne, September 3-7, 2012.
- "Successive Refinement with Decoder Cooperation and its Channel Coding Duals", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, in **IEEE International Symposium on Information Theory (ISIT)**, Jul 1- Jul 6, 2012, Cambridge, MA, USA.
- "On Real Time Coding with Limited Lookahead", Himanshu Asnani and Tsachy Weissman, In **Proceedings of the 49th Annual Allerton Conference on Communications, Control and Computing**, Monticello, Illinois, September 28-30, 2011. (INVITED)
- "To Feed or Not to Feed Back", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, in **IEEE International Symposium on Information Theory (ISIT)**, Jul 31- Aug 5, 2011, Saint Petersburg, Russia (BEST STUDENT PAPER AWARD FINALIST).
- "Multi-terminal source coding with action dependent side information", Yeow-Khiang Chia, Himanshu Asnani, and Tsachy Weissman, in **IEEE International Symposium on Information Theory (ISIT)**, Jul 31- Aug 5, 2011, Saint Petersburg, Russia.
- "Multiple access channel with partial-cribbing encoders", Himanshu Asnani, and Haim Permuter, in **IEEE International Symposium on Information Theory (ISIT)**, Jul 31- Aug 5, 2011, Saint Petersburg, Russia.
- "Multiple access channel with partial and controlled cribbing encoders", Himanshu Asnani, and Haim Permuter, in **2010 IEEE 26th Convention of Electrical and Electronics Engineers in Israel (IEEEI)**, Nov 17-20, 2011, Eilat, Israel.
- "To Observe or Not to Observe the Channel State", Himanshu Asnani, Haim Permuter, and Tsachy Weissman, In **Proceedings of the 48th Annual Allerton Conference on Communications, Control and Computing**, Monticello, Illinois, September 29-October 1, 2010. (INVITED)
- "Learning to Optimally Exploit Multi-Channel Diversity in Wireless Systems", Prasanna Chaporkar, Alexandre Proutier and Himanshu Asnani, **IEEE INFOCOM 2010**, San Diego, CA.
- "Scheduling with Limited Information in Wireless Systems", Prasanna Chaporkar, Alexandre Proutier, Himanshu Asnani and Abhay Karandikar, in **Proceedings of the tenth ACM international symposium on Mobile ad hoc networking and computing (MobiHoc)**, New Orleans, LA May 2009 (BEST PAPER AWARD).
- "Social network analysis of the Short Message Service", Vikrat Tomar, Himanshu Asnani, Abhay Karandikar, Vinay Chander, Swati Agrawal, and Prateek Kapadia, in **2010 National Conference on Communications (NCC)**, India, Jan 29-31, 2010.