

## AARTI SINGH

Machine Learning Department, Carnegie Mellon University  
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### Research Interests:

Machine Learning, Statistics, Signal Processing, Interactive Learning, Application to Scientific domains

### Education:

**Ph.D.**, Electrical Engineering Aug 2008  
University of Wisconsin, Madison  
*Thesis:* Nonparametric set estimation problems in statistical inference and learning  
*Advisor:* Robert Nowak

**M.S.**, Electrical Engineering Dec 2003  
University of Wisconsin, Madison  
*Thesis:* Experimental investigation of TWT nonlinearities and distortion suppression by signal injection  
*Advisor:* John E. Scharer

**B.E.**, Electronics & Communication Engineering June 2001  
University of Delhi, India

### Professional Positions:

Jul 2017 - present **Associate Professor (Tenured)**  
Jul 2015 - Jul 2017 **Associate Professor**  
Aug 2009 - Jun 2015 **Assistant Professor**  
Machine Learning Department, School of Computer Science  
Carnegie Mellon University

Oct 2008 - Aug 2009 **Postdoctoral Research Associate**  
Program in Applied and Computational Mathematics, Princeton University

Jun 2001 - Aug 2008 **Graduate Research and Teaching Assistant**  
Electrical Engineering, University of Wisconsin - Madison

Jun - Aug 2000, Jan 2001 **Research Trainee**  
Central Electronics Engineering Research Institute, India

### Honors and Awards:

#### Research

2021 **Best student paper award**, Asilomar Conference on Signals, Systems, and Computers  
2018 **Franklin V. Taylor Memorial Best paper Award**, IEEE International Conference on Systems, Man and Cybernetics, SMC  
2018 **NVIDIA Pioneer Award**, Neural Information Processing Systems (NeurIPS) Conference  
2016 **Expert network of World Economic Forum**  
2014 **United States Air Force Office of Scientific Research Young Investigator Award**  
2013 **Best student paper award**, Asilomar Conference on Signals, Systems, and Computers

- 2013 **National Science Foundation CAREER** award
- 2009 **Harold A. Peterson Best Dissertation Award**, Electrical and Computer Engineering Department, University of Wisconsin - Madison

### **Academic**

- 2013-16 **A. Nico Habermann Junior Faculty Chair** Award
- 2005 Grand Integrator of Madison, University of Wisconsin Integration Bee
- 1997-98 Merit Scholarships - 1st rank, Electronics and Communications Engineering Department, Netaji Subhas Institute of Technology, Delhi University

### **Service**

- 2021-26 **External advisory board, NSF AI Institute** for Future Edge Networks and Distributed Intelligence (AI-EDGE)
- 2021-22 **NASEM Committee on Advising NSF** on its Efforts to Achieve the Nation's Vision for the Materials Genome Initiative (DMREF)
- 2021-22 **Lead expert team**, ONR/NIST supported TMS A.I. Science & Technology Accelerator Study
- 2021 **Panelist, NASEM broadening data science education** for the future biomanufacturing workforce
- 2020 **ICML Program Co-Chair**, International Conference on Machine Learning
- 2018 **Steering Committee Member**, NSF Innovation Lab on Data Inspired Chemistry
- 2017-23 **NAS Committee Member**, National Academy of Sciences Committee on Applied and Theoretical Statistics, United States
- 2017 **AISTATS Program Co-Chair**, International Conference on Artificial Intelligence and Statistics
- 2013 **IMS NRC Program Chair**, Institute of Mathematical Statistics New Researchers Conference

### **Teaching:**

Carnegie Mellon University, Assistant & Associate Professor

Undergraduate Introduction to Machine Learning 10-315: Fall'21, Fall'20, Fall'19

Undergraduate Introduction to Machine Learning 10-401: Spring'16

PhD Introduction to Machine Learning 10-701/15-781: Spring'21, Spring'17, Fall'14, Spring'14, Fall'12, Fall'10, Spring'10

MS Introduction to Machine Learning 10-601: Fall'15, Fall'11

Information Processing and Learning 10-704: Fall'16, Spring'15, Spring'12

Statistical Machine Learning 10-702/36-702: Spring'13, Spring'11

Convex Optimization 10-725: Fall'17

Data Analysis Course 10-718: Fall'18

MLD Speaking Skills Journal Club: Spring'10, Fall'09

University of Wisconsin-Madison, Teaching Assistant

Theory and Applications of Pattern Recognition: Spring'05

Digital Image Processing: Fall'04

Circuits Lab: Fall'01 - Spring'03

## Student Advising:

### Current

- PhD Ivan Stelmakh (PhD, Machine Learning) - co-advised with Nihar Shah  
Jayanth Koushik (PhD, Program in Neural Computation) - co-advised with Mike Tarr  
Stefani Karp (PhD, Computer Science)  
Ojash Neopane (PhD, Machine Learning) - co-advised with Aaditya Ramdas  
Yusha Liu (PhD, Machine Learning)  
YJ Choe (PhD, joint Statistics-Machine Learning)
- Masters Ari Fiorino (MS, Computer Science)

### Former

- PhD Yichong Xu (PhD, Machine Learning) - co-advised with Artur Dubrawski  
Thesis: *Learning and Decision Making from Diverse Forms of Information*  
Year of completion: 2020  
Current position: Senior Researcher, Microsoft Research
- Simon Du (PhD, Machine Learning) - co-advised with Barnabas Poczos  
Thesis: *Gradient Descent for Non-convex Problems in Modern Machine Learning*  
**CMU SCS Dissertation Award Honorable Mention**  
Year of completion: 2019  
Current position: Assistant Professor, School of Computer Science and Engineering, University of Washington-Seattle
- Yining Wang (PhD, Machine Learning)  
Thesis: *Selective Data Acquisition in Learning and Decision Making Problems*  
Year of completion: 2019  
Current position: Assistant Professor, Department of Information Systems and Operations Management, Warrington College of Business, University of Florida
- Martin Azizyan (PhD, Machine Learning)  
Thesis: *High-Dimensional Analysis of Unsupervised Learning Problems*  
Year of completion: 2016
- Aaditya Ramdas (PhD, Machine Learning) - co-advised with Larry Wasserman  
Thesis: *Computational and Statistical Advances in Testing and Learning*  
**Best Thesis Award**, Statistics Department  
Year of completion: 2015  
Current position: Assistant Professor, Statistics Department, Carnegie Mellon University
- Akshay Krishnamurthy (PhD, Computer Science)  
Thesis: *Interactive Algorithms for Unsupervised Machine Learning*  
Year of completion: 2015  
Current position: Principal Researcher, Microsoft Research NYC
- James Sharpnack (PhD, Joint Stat-Machine Learning) - co-advised with Alessandro Rinaldo  
Thesis: *Graph Structured Normal Means Inference*  
Year of completion: 2013  
Current position: Assistant Professor, Statistics Department, University of California - Davis

Postdoc Gautam Dasarathy (postdoc, Machine Learning)  
Next: Postdoc, Rice University; Assistant Professor, Electrical, Computer and Energy Engineering, Arizona State University

Masters Xueying Ding (MS, Machine Learning)  
Next: PhD student, Heinz College, CMU

Sungjun Choi (MS, Machine Learning)  
Next: Software Engineer, NVIDIA

Aparna Joshi (MS, Machine Learning)  
Next: Software Engineer, Apple

Hariank Muthakana (MS, Computer Science)  
Next: Software Engineer, Abnormal Security

Vivek Nangia (MS, Machine Learning)  
Next: System Trading Associate, JP Morgan

Chiqun Zhang (MS, Machine Learning)  
Next: PhD student, Civil and Environmental Engineering, CMU

Tianshu Ren (MS, Machine Learning)  
Next: Software Engineer, Facebook

Y J Choe (PhD, Joint Statistics-Machine Learning)  
Next: Joint Stat-ML PhD student

Jayanth Koushik (MS, Language Technologies)  
Next: PhD student, Program in Neural Computation, CMU

Undergrad Hariank Muthakana (BS, Computer Science)  
Next: MS student, Machine Learning

Hanqi Sun (BS, Computer Science)  
Next: Software Engineer, NVIDIA

Vivek Nangia (BS, Computational Finance and Computer Sciences)  
Next: MS student, Machine Learning

David Isenberg (BS, Computer Science)  
Next: Data Scientist, Litbit

Jong Hyuk Park (BS, Chemistry and Computer Science)  
**Yahoo! Undergraduate Research Award Runner-Up**, Meeting of the Minds, CMU 2015  
Next: Research Assistant, Machine Learning Department, CMU

Madeleine Clute (BS, Computer Science)  
Next: Google, NY

Tongbo Huang (BS, Electrical and Computer Engineering and Human-Computer Interaction)  
Next: Software Engineer, Pinterest

## Invited Talks:

### Meetings, Conferences and Workshops

- **Panelist, NASEM broadening data science education** for the future biomanufacturing workforce, 2021.
- **Conference on the Mathematical Theory of Deep Neural Networks (DeepMath)**, Virtual, 2021.
- **University of Chicago Data Science Initiative (DSI)**, Distinguished Speaker Series, 2021.
- **Isaac Newton Institute**, Program on Mathematics of Deep Learning, Cambridge, 2021.
- **Institute for Computational and Experimental Research in Mathematics (ICERM)**, Workshop on Advances in Theory and Algorithms for Deep Reinforcement Learning, Brown University, 2021.
- **NSF AI for Physics Planning Institute**, Plenary Speaker, CMU, 2021.
- **Computer Vision and Pattern Recognition (CVPR) Workshop** on Learning from Limited and Imperfect Data, 2021.
- **Symposium on Data Science and Statistics (SDSS)**, Virtual, 2020.
- **Simons Institute**, Workshop on Frontiers of Deep Learning, Berkeley, CA, 2019.
- **International Conference on Machine Learning (ICML) Workshop** on Negative Dependence in Machine Learning, Los Angeles, CA, 2019.
- **Women in Data Science (WIDS) Pittsburgh @ CMU**, 2019.
- **American Association for the Advancement of Science (AAAS)** symposium on Automating Scientific Discovery across Disciplines, Washington DC, 2019.
- **International Conference on Machine Learning and its Applications**, Plenary Speaker, ICMLA, Orlando, FL, 2018.
- **National Academy of Sciences (NAS) Board on Mathematical Sciences and Analytics (BMAS) Math Frontiers Webinar**, Speaker, Virtual, 2018.
- **Mathematical Institute for Data Science (MINDS)**, Plenary Speaker at Inaugural Symposium, John Hopkins University, 2017.
- **Simons Institute**, Workshop on Computational Challenges in Machine Learning, Berkeley, CA, 2017.
- **Simons Institute**, Workshop on Interactive Learning, Berkeley, CA, 2017.
- **Graph Signal Processing workshop**, Pittsburgh, PA, 2017.
- **International Workshop on Statistical Analysis of Neuronal Data (SAND)**, Pittsburgh, PA, 2017.
- **Workshop on Algorithms for Modern Massive Data Sets (MMDS)**, Berkeley, CA, 2016.
- **McKinsey Analytics Program for Executive Education**, Pittsburgh, PA, 2016.
- **Neural Information Processing Systems (NIPS)**, Easy Data II Workshop, Montreal, Canada, 2015.
- **World Economic Forum**, IdeasLab, Annual Meeting of the New Champions, Dalian, China, 2015.
- **Joint Statistical Meetings**, Tradeoffs in Resource-constrained Statistical Learning, Seattle, WA, 2015.
- **Institute for Mathematics and its Applications (IMA)**, Workshop on Graphical Models, Statistical Inference, and Algorithms (GRAMSIA), Minnesota, MN, 2015.
- **Air Force Research Laboratory**, Complex Networks Technical Interchange, Rome, NY, 2014.

- **International Society for Business and Industrial Statistics (ISBIS) and the ASA Section on Statistical Learning and Data Mining (SLDM) joint meeting**, Active Learning session, Durham, NC, 2014.
- **SIAM Conference on Optimization**, Minisymposium on Optimization for Clustering and Classification, San Diego, CA, 2014.
- **Institut des Hautes Études Scientifiques (IHES)**, Fête Parisienne in Computation, Inference and Optimization: A Young Researchers' Forum, Paris, France, 2013.
- **Banff International Research Station**, Workshop on Asymptotics of Large-Scale Interacting Networks, Banff, Canada, 2013.
- **Information Theory and Applications (ITA) Workshop**, San Diego, CA, 2013.
- **Systems, Information, Learning, and Optimization (SILO) Workshop**, Madison, WI, 2013.
- **LaunchCMU Research and Technology Startup Showcase**, Pittsburgh, PA, 2013.
- **International Conference on Signal Processing and Communications (SPCOM)**, Bangalore, India, 2012.
- **National Security Agency (NSA) Graph Analytics Workshop**, Pittsburgh, PA, 2012.
- **SIAM Conference on Imaging Science**, Minisymposium on Low Rank Modeling and its Applications to Imaging, Philadelphia, PA, 2012.
- **Information Theory and Applications (ITA) Workshop**, San Diego, CA, 2012.
- **Institute for Mathematics and its Applications (IMA)**, Workshop on Large Graphs: Modeling, Algorithms and Applications, Minnesota, MN, 2011.
- **Workshop on Infusing Statistics and Engineering**, Cambridge, MA, 2011.
- **Information Theory and Applications (ITA) Workshop**, San Diego, CA, 2011.
- **Shanks Workshop on Machine learning and the Analysis of High Dimensional Data Sets**, Nashville, TN, 2010.
- **Statistical and Applied Mathematics Sciences Institute (SAMSI)**, Complex Networks Modeling Workshop, Research Triangle Park, NC, 2010.
- **International Conference on Statistics and Society**, Sparse inference session, Beijing, China, 2010.
- **SIAM Conference on Imaging Science**, Minisymposium on Emerging Themes in Geometric Data Modeling with Applications to Imaging, Chicago, IL, 2010.
- **Information Theory and Applications (ITA) Workshop**, San Diego, CA, 2010.
- **Workshop on Statistical Signal Processing**, Madison, WI, 2009.
- **Network Mapping and Measurement Conference (NMMC)**, Laboratory for Telecommunications Sciences, College Park, MD, 2009.

### Departmental Seminars

- **John Hopkins University**, Department of Civil and Systems Engineering, 2021.
- **Stanford University**, Information Systems Laboratory (ISL) Colloquium, 2021.
- **University of California, Berkeley**, Berkeley Laboratory for Information and System Sciences Seminar, 2021.

- **Carnegie Mellon University**, Physics Department, 2020.
- **MIT**, Laboratory for Information and Decision Sciences (LIDS) Seminar, 2019.
- **Georgia Institute of Technology**, School of Industrial and Systems Engineering, Stat Seminar, 2017.
- **University of Pittsburgh**, Department of Statistics, 2017.
- **University of California, Berkeley**, Neyman Statistics Seminar, 2017.
- **Carnegie Mellon University**, Electrical and Computer Engineering Department, 2017.
- **Princeton University**, Wilks Statistics Seminar, 2015.
- **University of Pennsylvania**, Wharton Statistics Department, 2015.
- **Duke University**, Electrical and Computer Engineering Department, 2014.
- **University of California, San Diego**, Computer Science Department, 2014.
- **University of Wisconsin, Madison**, Computer Science Department, 2012.
- **Georgia Institute of Technology**, School of Electrical and Computer Engineering, 2012.
- **University of Wisconsin, Madison**, Electrical and Computer Engineering Department, 2011.
- **Boston University**, Statistics & Probability seminar, Department of Mathematics and Statistics, 2010.
- **Carnegie Mellon University**, Statistics Department, 2009.
- **Purdue University**, Electrical and Computer Engineering Department, 2009.
- **West Virginia University**, Lane Department of Computer Science & Electrical Engineering, 2009.
- **Carnegie Mellon University**, Machine Learning Department, 2009.
- **Rice University**, Electrical and Computer Engineering Department, 2009.

### **Professional Activities:**

<b>Program Chair</b>	International Conference on Machine Learning ICML 2020 International Conference on Artificial Intelligence and Statistics AISTATS 2017 Institute of Mathematical Statistics (IMS) New Researchers Conference 2013
<b>Associate Editor</b>	IEEE Transactions on Information Theory, 2019-21 IEEE Transactions on Signal and Information Processing over Networks, 2019-21
<b>Guest Editor</b>	Electronic Journal of Statistics, special issue, 2017
<b>Senior Committee</b>	External advisory board, NSF AI Institute for Future Edge Networks and Distributed Intelligence (AI-EDGE), 2021-26 Committee on Applied and Theoretical Statistics, National Academy of Sciences 2017-2023 NASEM Committee on Advising NSF on its Efforts to Achieve the Nation's Vision for the Materials Genome Initiative (DMREF), 2021-22 Lead expert team, ONR/NIST supported TMS A.I. Science & Technology Accelerator Study, 2021-22 Scientific committee of the Conference of International Indian Statistical Association (IISA), 2022 Conference review process committee, NeurIPS 2021 NSF Innovation Lab on Data Inspired Chemistry 2018

International Conference on Artificial Intelligence and Statistics AISTATS 2016  
Conference on Neural Information Processing Systems NIPS 2012, 2013, 2015  
International Conference on Machine Learning ICML 2013, 2015  
IEEE International Conference on Big Data 2013  
ASE/IEEE International Conference on Big Data 2013  
Institute of Mathematical Statistics (IMS) New Researchers Conference 2012  
International Conference on Signal Processing and Communications, SPCOM 2012  
IEEE Wireless Communications and Mobile Computing Conference, IWCMC 2010

**Organizer**

AAAI workshop on Design and Manufacturing (ADAM), 2022  
National Academies Workshop on ML/AI to Advance Earth System Science, 2021  
Machine Learning in Materials Science Symposium, Materials Science & Technology (MS&T) Meeting, 2020  
Simons Institute Workshop on Sublinear Algorithms and Nearest Neighbor Search, 2018  
ICML Workshop on Active Learning: Theory and Practice, 2015  
Institute of Mathematical Statistics (IMS) Annual Meeting, Invited session, 2015  
NIPS Workshop on Algebraic Topology and Machine Learning, 2012  
Institute for Mathematics and its Applications (IMA), Workshop on High Dimensional Phenomena, 2011  
IEEE Statistical Signal Processing Workshop SSP, Student organizer, 2007

**Grant Reviewer**

NSF IIS Panelist 2010, 2011, 2017  
United States-Israel Binational Science Foundation 2013

**Paper Reviewer**

Journal of Machine Learning Research  
Annals of Statistics  
Annals of Applied Statistics  
Proceedings of the National Academy of Sciences  
IEEE Transactions on Information Theory  
IEEE Transactions on Signal Processing  
ACM Transactions on Sensor Networks  
Communications of the ACM  
Probability Theory and Related Fields  
Elsevier Journal of Multivariate Analysis  
Statistics and Computing Journal  
Machine Learning Journal  
Journal of Mathematical Imaging and Vision  
IEEE International Symposium on Information Theory ISIT 2014  
IEEE International Symposium on Signal Processing Advances in Wireless Communications SPAWC 2014  
Intl. Conf. Artificial Intelligence and Statistics AISTATS 2010, 2011, 2012, 2013  
International Conference on Machine Learning ICML 2010, 2012  
Uncertainty in Artificial Intelligence UAI 2012  
Conference on Learning Theory COLT 2009, 2012  
Conference on Neural Information Processing Systems NIPS 2008, 2009, 2010  
IEEE Wireless Comm. and Mobile Computing Conference IWCMC 2009, 2010



## University Activities:

- Co-director** Machine Learning Department PhD program, 2017-18
- Service Committees** CMU, SCS Women Faculty Steering Committee, 2021  
CMU, K&L Gates Ethics and Computation Steering Committee, 2017-2018  
CMU, Neuroscience Institute Head Search Committee, 2016-17  
CMU, Brainhub Steering Committee, 2015-18  
CMU, Berkman Grant Committee, 2010, 2011  
School of Computer Science, Dean Search Committee, 2013-14  
School of Computer Science, Fellowship Committee, 2011  
School of Computer Science, Google Fellowship Committee 2010  
Machine Learning Department, Review and promotion committees' member (2) and chair (2), 2019-21  
Machine Learning Department, PhD admissions committee, 2021  
Machine Learning Department, Speaking skills committee, 2019-21  
Machine Learning Department, Wellness committee, 2017-19  
Machine Learning Department, Hiring Committee, 2011, 2012, 2016  
Machine Learning Department, Head Search Committee, 2015  
Machine Learning Department, Retreat Organizing Committee, 2013
- Mentorship** Machine Learning Department, Junior Faculty Mentor (Hoda, Virginia)  
Joint Statistics-Machine Learning, ML Mentor (Addison Hu)  
Joint Machine Learning-Public Policy, ML Mentor (Lingxiao Zhao)
- Thesis Committees** Ruosong Wang (PhD, Machine Learning)  
(Non-advisees) *Tackling Challenges in Modern Reinforcement Learning: Long Planning Horizon and Large State Space*  
Patrick Funk (PhD, Engineering and Public Policy)  
*Modeling Expert choice at the Technical Frontier*  
Dhivya Eswaran (PhD, Computer Science)  
*Mining Anomalies using Static and Dynamic Graphs*  
Yuxin Wu (PhD, Language and Information Technology)  
*Learning with Graph-based Modeling and Neural Networks*  
Veeranjaneyulu Sadhanala (PhD, Machine Learning)  
*Nonparametric Methods with Total Variation Type Regularization*  
Kirthivasan Kanadasamy (PhD, Machine Learning)  
*Tuning Hyper-parameters without Grad Students: Scaling up Bandit Optimisation*  
Victor Okhoya (PhD, Architecture)  
*Applications of Data Science in Architecture*  
Pengcheng Zhou (PhD, Joint Neural Computation and Machine Learning)  
*Computational Tools for Identification and Analysis of Neuronal Population Activity*  
Miguel Araujo (PhD, CMU-Portugal Program)  
*Communities and Anomalies in Large Labeled Graphs*

Siheng Chen (PhD, Electrical and Computer Engineering)  
*Data Science on Graphs: Tools and Applications*

Yifei Ma (PhD, Machine Learning)  
*Active Search and Bandit Methods for Complex Actions and Rewards*

Eric Heim (PhD, Computer Science, University of Pittsburgh)  
*Efficiently and effectively learning models of similarity from human feedback*

Min Xu (PhD, Machine Learning)  
*Shape constrained estimation in high dimensions*

Narges Sharif Razavian (PhD, Language Technologies)  
*Continuous Graphical Models for Static and Dynamic Distributions: Application to Structural Biology*

Sivaraman Balakrishnan (PhD, Language Technologies)  
*Finding and Leveraging Structure in Learning Problems*

Mladen Kolar (PhD, Machine Learning)  
*Uncovering Structure in High-Dimensions: Networks and Multi-task Learning Problems*

Brian Kent (PhD, Statistics)  
*Using structured sparse regression to add anatomical constraints to functional brain connectivity models*

Liang Xiong (PhD, Machine Learning)  
*On Learning from Collective Data*

Leman Akoglu (PhD, Computer Science)  
*Mining and Modeling Real Graphs: Patterns, Generators, Anomalies, and Tools*

Maheshkumar Sabhnani (PhD, Machine Learning)  
*Disjunctive Anomaly Detection: Identifying Complex Anomalous Patterns*

Yang Xu (PhD, Machine Learning - special track in the center for the neural basis of cognition)  
*Dynamics of visual category learning with MEG*

Daniel Percival (PhD, Statistics)  
*Structured Sparsity*

Shannon Quinn (MS, Biological Sciences)  
*A Framework for Inferring Protein Location as a Function of Condition*

### **Outreach Activities:**

<b>Invited Speaker</b>	Winchester Thurston High School, Pittsburgh, PA, 2021-22 Women in Data Science, Pittsburgh@CMU, 2019 Andrew's Leap - summer enrichment program for high school students, CMU, 2012
<b>Team Leader</b>	Neurohackathon, QualComm and Brainhub, CMU, 2015 Opportunities for undergraduate women research in Computer Science (OurCS), CMU, 2011, 2015

<b>Panelist</b>	ACM SIGKDD Conference on Knowledge Discovery and Data mining (KDD) Women's Panel, 2021 STEM superstar for Girls Love STEM Mashup, Carnegie Science Center, Pittsburgh, PA, 2015 AAUW (The American Association of University Women) STEM Careers high school program, Fox Chapel, PA, 2011, 2013 PA STEM Girls Collaborative Annual Conference, Allison Park, PA, 2011 Faculty panel, Women@SCS lunch, CMU, 2011
<b>Mentor</b>	Women in Machine Learning (WiML) workshop, NeurIPS 2020

### **Research Publications:**

(Available at <http://www.cs.cmu.edu/~aarti/pubs.html>)

### **Journal papers:**

1. C. Rastogi, S. Balakrishnan, N. B. Shah and A. Singh. Two-Sample Testing with Pairwise Comparison Data and the Role of Modeling Assumptions. *Journal of Machine Learning Research (JMLR)*, 2021, *accepted*.
2. I. Stelmakh, N. Shah and A. Singh. PeerReview4All: Fair and Accurate Reviewer Assignment in Peer Review. *Journal of Machine Learning Research (JMLR)*, vol. 22, no. 163, pp. 1-66, 2021.
3. I. Kim\*, A. Ramdas\*, A. Singh and L. Wasserman. Classification accuracy as a proxy for two sample testing. *Annals of Statistics*, vol. 49, no. 1, pp. 411-434, 2021.
4. Z. Allen-Zhu\*, Y. Li\*, A. Singh\* and Y. Wang\*. Near-Optimal Discrete Optimization for Experimental Design: A Regret Minimization Approach. *Mathematical Programming (Series A)*, vol. 186, pp. 439-478, 2021.
5. Y. Xu, H. Muthakana, S. Balakrishnan, A. Singh and A. Dubrawski. Nonparametric Regression with Comparisons: Escaping the Curse of Dimensionality with Ordinal Information. *Journal of Machine Learning Research (JMLR)*, vol. 21, no. 162, pp. 1-54, 2020.
6. E. M. Jimenez, D. Ding, L. Su, A. R. Joshi, A. Singh, B. Reeja-Jayan and J. Beuth. Parametric Analysis to Quantify Process Input Influence on the Printed Densities of Binder Jetted Alumina Ceramics. *Additive Manufacturing*, vol. 30, 100864, 2019.
7. Y. Wang, J. Wang, S. Balakrishnan and A. Singh. Rate Optimal Estimation and Confidence Intervals for High-dimensional Regression with Missing Covariates. *Journal of Multivariate Analysis*, vol. 174, pp. 104526, 2019.
8. Y. Wang, S. Balakrishnan and A. Singh. Optimization of Smooth Functions with Noisy Observations: Local Minimax Rates. *IEEE Transactions on Information Theory*, vol. 65, no. 11, pp.7350-7366, 2019.
9. Y. Wang, Y.-X. Wang and A. Singh. A Theoretical Analysis of Noisy Sparse Subspace Clustering on Dimensionality-Reduced Data. *IEEE Transactions on Information Theory*, vol. 65, no. 2, pp. 685-706, 2019.
10. M. Azizyan, A. Krishnamurthy, A. Singh. Extreme Compressive Sampling for Covariance Estimation. *IEEE Transactions on Information Theory*, vol. 64, no. 2, pp. 7613-7635, 2018.

11. Y. Wang and A. Singh. Provably Correct Active Sampling Algorithms for Matrix Column Subset Selection with Missing Data. *Journal of Machine Learning Research (JMLR)*, pp. 1-42, vol. 18, no. 156, 2018.
12. Y. Wang, A. W. Yu and A. Singh. On Computationally Tractable Selection of Experiments in Measurement Constrained Regression Models. *Journal of Machine Learning Research (JMLR)*, pp. 1-41, vol. 18, no. 143, 2017.
13. S. Balakrishnan, M. Kolar, A. Rinaldo and A. Singh. Recovering Block-structured Activations Using Compressive Measurements. *Electronic Journal of Statistics*, pp. 2647-2678, vol. 11, no. 1, 2017.
14. S. Chen, Y. Yang, S. Zong, A. Singh, and J. Kovačević. Detecting localized categorical attributes on graphs. *IEEE Transactions on Signal Processing*, pp. 2725 - 2740, vol. 65, no. 10, 2017.
15. P. J. Gianaros, L. K. Sheu, F. Uyar, J. Koushik, J. R. Jennings, T. Wager, A. Singh and T. Verstynen. A Brain Phenotype for Stressor-Evoked Blood Pressure Reactivity. *Journal of the American Heart Association (JAHA)*, e006053, vol. 6, no. 9, 2017.
16. F.-C. Yeh, J. Vettel, A. Singh, B. Poczos, S. Grafton, K. Erickson, W.-Y. Tseng, and T. Verstynen. Quantifying Differences and Similarities in Whole-Brain White Matter Architecture Using Local Connectome Fingerprints. *PLOS Computational Biology*, e1005203, pp. 1-17, vol. 12, no. 11, 2016.
17. S. Chen, R. Varma, A. Singh, and J. Kovačević. Signal recovery on graphs: Fundamental limits of sampling strategies. *IEEE Transactions on Signal and Information Processing over Networks, special issue on Inference and Learning over Networks*, pp. 539 - 554, vol. 2, no. 4, 2016.
18. J. Sharpnack, A. Singh and A. Rinaldo. Detecting Anomalous Activity on Networks with the Graph Fourier Scan Statistic. *IEEE Transactions on Signal Processing*, pp. 364-379, vol. 64, no. 2, 2016.
19. B. Fasy, F. Lecci, A. Rinaldo, L. Wasserman, S. Balakrishnan and A. Singh. Confidence Sets For Persistence Diagrams. *Annals of Statistics*, Vol. 42, No. 6, 2301-2339, 2014.
20. F. Chazal, B. Fasy, F. Lecci, A. Rinaldo, A. Singh and L. Wasserman. On the Bootstrap for Persistence Diagrams and Landscapes. *Modeling and Analysis of Information Systems*, pp. 111-120, vol. 20, no. 6, 2013.
21. M. Azizyan, A. Singh and L. Wasserman. Density-sensitive Semisupervised Inference. *Annals of Statistics*, pp. 751-771, vol. 41, no. 2, 2013.
22. A. Rinaldo, A. Singh, R. Nugent and L. Wasserman. Stability of Density-based Clustering. *Journal of Machine Learning Research (JMLR)*, pp. 905-948, vol. 13, 2012.
23. A. Singh, C. Scott and R. Nowak. Adaptive Hausdorff Estimation of Density Level Sets. *Annals of Statistics*, pp. 2760-2782, vol. 37, no. 5B, 2009.
24. A. Singh, J. E. Scharer, J. H. Booske and J. G. Wöhlbier. Second and Third-order Signal Injection for Nonlinear Distortion Suppression in a Traveling Wave Tube. *IEEE Transactions on Electron Devices, Special Issue on Vacuum Electron Devices*, pp. 709-717, vol. 52, no. 5, May 2005.
25. A. Singh, J. G. Wöhlbier, J. H. Booske and J. E. Scharer. Experimental Verification of the Mechanisms for Nonlinear Harmonic Growth and Suppression by Harmonic Injection in a Traveling Wave Tube. *Physical Review Letters*, vol. 92, no. 20, Article 205005, 2004.

26. S. Bhattacharjee, C. Marchewka, J. Welter, R. Kowalczyk, C. B. Wilsen, Y. Y. Lau, J. H. Booske, A. Singh, J. E. Scharer, R. M. Gilgenbach, M. J. Neumann, and M. W. Keyser. Suppression of Third-order Intermodulation in a Klystron by Third-order Injection. *Physical Review Letters*, 90, Article 098303, 2003.
27. M. Wirth, A. Singh, J. Scharer and J. Booske. Third-Order Intermodulation Reduction by Harmonic Injection in a TWT Amplifier. *IEEE Transactions on Electron Devices*, pp. 1082-84, vol. 49, No. 6, June 2002.

### Peer-Reviewed Conference papers<sup>1</sup>:

28. S. Karp, E. Winston, Y. Li and A. Singh. Local Signal Adaptivity: Provable Feature Learning in Neural Networks Beyond Kernels. *Neural Information Processing Systems, NeurIPS*, 2021. (acceptance rate = 26%)
29. O. Neopane, A. Ramdas and A. Singh. Best Arm Identification under Additive Transfer Bandits. *Asilomar Conference on Signals, Systems, and Computers*, 2021, **best student paper award**.
30. Y. Liu, Y. Wang and A. Singh. Smooth Bandit Optimization: Generalization to Holder Space. *Artificial Intelligence and Statistics, AISTATS*, 2021. (acceptance rate  $455/1527 = 29.8\%$ )
31. I. Stelmakh, N. Shah and A. Singh. Catch Me if I Can: Detecting Strategic Behaviour in Peer Assessment. *AAAI Conference on Artificial Intelligence*, 2021. (acceptance rate  $1692/7911 = 21\%$ )
32. I. Stelmakh, N. Shah, A. Singh and H. Daume III. A Novice-Reviewer Experiment to Address Scarcity of Qualified Reviewers in Large Conferences. *AAAI Conference on Artificial Intelligence*, 2021. (acceptance rate  $1692/7911 = 21\%$ )
33. I. Stelmakh, N. Shah, A. Singh and H. Daume III. Prior and Prejudice: The Novice Reviewers' Bias against Resubmissions in Conference Peer Review. *ACM Conference on Computer-Supported Cooperative Work and Social Computing, CSCW* 2021.
34. Y. Xu, R. Wang, L. F. Yang, A. Singh and A. Dubrawski. Preference-based Reinforcement Learning with Finite-Time Guarantees. *Neural Information Processing Systems, NeurIPS* 2020. (acceptance rate  $1900/9454 = 20\%$ , spotlight 3%)
35. Y. Xu, A. Joshi, A. Singh and A. Dubrawski. Zeroth Order Non-convex optimization with Dueling-Choice Bandits. *Conference on Uncertainty in Artificial Intelligence, UAI* 2020. (acceptance rate  $142/515 = 27.6\%$ )
36. Y. Xu, X. Chen, A. Singh and A. Dubrawski. Thresholding Bandit Problem with both Duels and Pulls. *Artificial Intelligence and Statistics, AISTATS* 2020.
37. C. Rastogi, S. Balakrishnan, N. B. Shah and A. Singh. Two-Sample Testing with Pairwise Comparison Data and the Role of Modeling Assumptions. *IEEE International Symposium on Information Theory, ISIT* 2020.
38. I. Stelmakh, N. B. Shah and A. Singh. On testing for biases in peer review. *Neural Information Processing Systems, NeurIPS* 2019. (acceptance rate  $1428/6743 = 21.1\%$ , spotlight  $164/6743 = 2.4\%$ )  
*A preliminary version appeared in workshop on Mechanism Design for Social Good, MD4SG, 2019.*

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<sup>1</sup>In Computer Science, peer-reviewed conferences are typically highly selective and the primary mode of publication; note acceptance rates.

39. I. Stelmakh, N. B. Shah and A. Singh. PeerReview4All: Fair and Accurate Reviewer Assignment in Peer Review. *Algorithmic Learning Theory*, ALT 2019.
40. S. S. Du\*, X. Zhai\*, B. Póczos and A. Singh. Gradient Descent Provably Optimizes Over-parameterized Neural Networks. *International Conference on Learning Representations*, ICLR 2019. (acceptance rate  $500/1591 = 31.4\%$ )
41. Y. Wu, B. Póczos and A. Singh. Towards Understanding the Generalization Bias of Two Layer Convolutional Linear Classifiers with Gradient Descent. *Artificial Intelligence in Statistics*, AISTATS 2019. (acceptance rate  $360/1111=32\%$ )
42. Y. Wang, S. Balakrishnan and A. Singh. Optimization of Smooth Functions with Noisy Observations: Local Minimax Rates. *Neural Information Processing Systems*, NeurIPS 2018. (acceptance rate  $1011/4856 = 20.8\%$ )
43. S. Du\*, Y. Wang\*, X. Zhai, S. Balakrishnan, R. Salakhutdinov and A. Singh. How Many Samples are Needed to Learn a Convolutional Neural Network? *Neural Information Processing Systems*, NeurIPS 2018. **NVIDIA Pioneer Award** (acceptance rate  $1011/4856 = 20.8\%$ )
44. Y. Xu, S. Balakrishnan, A. Singh and A. Dubrawski. Interactive Linear Regression with Pairwise Comparisons. *Asilomar Conference on Signals, Systems and Computers*, 2018, *invited paper*.
45. Y. Wang, E. Ulu, A. Singh and L. B. Kara. Efficient Load Sampling for Worst-Case Structural Analysis under Force Location Uncertainty. *ASME 2018 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, IDETC 2018.
46. Y. J. Choe, S. Balakrishnan, A. Singh, J. M. Vettel and T. Verstynen. Local White Matter Architecture Defines Functional Brain Dynamics. *IEEE International Conference on Systems, Man and Cybernetics*, SMC 2018, **Franklin V. Taylor Memorial best paper award**.
47. Y. Xu, H. Muthakana, S. Balakrishnan, A. Singh and A. Dubrawski. Nonparametric Regression with Comparisons: Escaping the Curse of Dimensionality with Ordinal Information. *International Conference on Machine Learning*, ICML 2018. (acceptance rate  $618/2473 = 25\%$ , Long talk)
48. S. Du, J. D. Lee, Y. Tian, B. Póczos and A. Singh. Gradient Descent Learns One-hidden-layer CNN: Don't be Afraid of Spurious Local Minima. *International Conference of Machine Learning*, ICML 2018. (acceptance rate  $618/2473 = 25\%$ , Long talk)
49. X. Lei, M. Berges, B. Akinci and A. Singh. Experiments in using nonlinear regression for business activity normalization in the Energy Star benchmarking method. *International Conference on Computing in Civil and Building Engineering*, ICCCB 2018.
50. Y. Wang, S. Du, S. Balakrishnan and A. Singh. Stochastic Zeroth-order Optimization in High Dimensions. *Accepted as oral presentation at International Conference on Artificial Intelligence and Statistics*, AISTATS 2018. (acceptance rate  $214/645 = 33\%$ , oral  $31/645 = 4.8\%$ )
51. Y. Wang and A. Singh. Linear quantization by effective resistance sampling. *Accepted at IEEE International Conference on Acoustics, Speech and Signal Processing*, ICASSP 2018, *invited paper*.
52. S. Du, C. Jin, J. Lee, M. Jordan, B. Póczos and A. Singh. Gradient Descent Can Take Exponential Time to Escape Saddle Points. *Neural Information Processing Systems*, NIPS 2017. (acceptance rate  $679/3240 = 21\%$ , spotlight  $112/3240 = 3.45\%$ )

53. Y. Xu, H. Zhang, K. Miller, A. Singh and A. Dubrawski. Noise-Tolerant Interactive Learning Using Pairwise Comparisons. *Neural Information Processing Systems, NIPS 2017*. (acceptance rate 679/3240 = 21%)
54. S. Du, Y. Wang and A. Singh. On the Power of Truncated SVD for General High-rank Matrix Estimation Problems. *Neural Information Processing Systems, NIPS 2017*. (acceptance rate 679/3240 = 21%)
55. S. Du, J. Koushik, A. Singh and B. Poczos. Hypothesis Transfer Learning via Transformation Functions. *Neural Information Processing Systems, NIPS 2017*. (acceptance rate 679/3240 = 21%)
56. Z. A.-Zhu, Y. Li, A. Singh, and Y. Wang. Near-Optimal Design of Experiments via Regret Minimization. *International Conference on Machine Learning, ICML 2017*. (acceptance rate 433/1701 = 25.5%) A preliminary version appeared in *NIPS workshop on Discrete Structures in Machine Learning, 2017*.
57. P. Xie, A. Singh, and E. Xing. Uncorrelation and Evenness: A New Diversity-Promoting Regularizer. *International Conference on Machine Learning, ICML 2017*. (acceptance rate 433/1701 = 25.5%)
58. S. Balakrishnan, S. S. Du, J. Li, and A. Singh. Computationally Efficient Robust Sparse Estimation in High Dimensions. *Conference of Learning Theory, COLT 2017*. (acceptance rate 73/228 = 32.0%)
59. Bo Li\*\*, Yining Wang\*\*, Aarti Singh and Yevgeniy Vorobeychik. Data Poisoning Attacks on Factorization-Based Collaborative Filtering. *Neural Information Processing Systems, NIPS 2016*. (acceptance rate 73/228 = 24.0%; spotlight presentation = 7.4%)
60. S. Chen, Y. Yang, A. Singh, and J. Kovačević. Signal detection on graphs: Bernoulli noise model. *IEEE Global Conference on Signal and Information Processing, GlobalSIP 2016*.
61. D. Isenberg, A. Ramdas, A. Singh and L. Wasserman. Minimax Lower Bounds for Linear Independence Testing. *IEEE International Symposium on Information Theory, ISIT 2016*.
62. S. Chen, R. Varma, A. Singh and J. Kovačević. A statistical perspective of sampling scores for linear regression. *IEEE International Symposium on Information Theory, ISIT 2016*.
63. G. Dasarathy, A. Singh, M.-F. Balcan and J.H. Park. Active Learning Algorithms for Graphical Model Selection. *International Conference on Artificial Intelligence and Statistics, AISTATS 2016*. (acceptance rate 165/537 = 30.7%; oral presentation 35/537 = 6.5%)
64. Y. Wang, Y.-X. Wang and A. Singh. Graph Connectivity in Noisy Sparse Subspace Clustering. *International Conference on Artificial Intelligence and Statistics, AISTATS 2016*. (acceptance rate 165/537 = 30.7%)
65. Y. Wang and A. Singh. Noise-adaptive Margin-based Active Learning for Multi-dimensional Data and Lower Bounds under Tsybakov Noise Condition. *AAAI Conference on Artificial Intelligence, AAAI 2016*. (acceptance rate 549/2132 = 26%)
66. S. Chen, R. Varma, A. Singh and J. Kovačević. Representations of piecewise smooth signals on graphs. *IEEE International Conference on Acoustic, Speech and Signal Processing, ICASSP 2016*.
67. Y. Wang, Y.-X. Wang and A. Singh. Differentially Private Subspace Clustering. *Annual Conference on Neural Information Processing Systems, NIPS 2015*. (acceptance rate 403/1838 = 21.9%)

68. Y. Wang, Y.-X. Wang and A. Singh. A Deterministic Analysis of Noisy Sparse Subspace Clustering for Dimensionality-reduced Data. *International Conference on Machine Learning, ICML 2015*. (acceptance rate  $270/1037 = 26.0\%$ )
69. Y. Wang and A. Singh. An Empirical Comparison of Sampling Techniques for Matrix Column Subset Selection. *Allerton Conference on Communication, Control and Computing*, 2015.
70. S. Chen, R. Varma, A. Singh and J. Kovačević. Signal recovery on graphs: Random versus experimentally designed sampling. *Sampling Theory and Applications, SampTA 2015, invited paper*.
71. Y. Wang and A. Singh. Column Subset Selection with Missing Data via Active Sampling. *International Conference on Artificial Intelligence and Statistics, AISTATS 2015*. (acceptance rate  $127/442 = 28.7\%$ )
72. S. Reddi, A. Ramdas, B. Poczos, A. Singh and L. Wasserman. On the High Dimensional Power of a Linear-Time Two Sample Test under Mean-shift Alternatives. *International Conference on Artificial Intelligence and Statistics, AISTATS 2015*. (acceptance rate  $127/442 = 28.7\%$ )
73. M. Azizyan, A. Singh and L. Wasserman. Efficient Sparse Clustering of High-Dimensional Non-spherical Gaussian Mixtures. *International Conference on Artificial Intelligence and Statistics, AISTATS 2015*. (acceptance rate  $127/442 = 28.7\%$ )
74. S. Reddi, A. Ramdas, B. Poczos, A. Singh and L. Wasserman. On the Decreasing Power of Kernel and Distance based Nonparametric Hypothesis Tests in High Dimensions. *AAAI Conference on Artificial Intelligence*, 2015. (acceptance rate  $531/1991 = 26.7\%$ )
75. M. Azizyan, A. Krishnamurthy and A. Singh. Subspace Learning from Extremely Compressed Measurements. *Asilomar Conference on Signals, Systems, and Computers*, 2014, *invited paper, finalist for best student paper award*.
76. A. Ramdas, B. Poczos, A. Singh and L. Wasserman. An Analysis of Active Learning with Uniform Feature Noise. *International Conference on Artificial Intelligence and Statistics, AISTATS 2014*. (acceptance rate =  $120/335 = 35.8\%$ ; oral presentation =  $22/335 = 6.6\%$ ).
77. J. Oliva, B. Poczos, T. Verstynen, A. Singh, J. Schneider, F.-C. Yeh and E.-Y. Tseng. FuSSO: Functional Shrinkage and Selection Operator. *International Conference on Artificial Intelligence and Statistics, AISTATS 2014*. A preliminary version appeared in *NIPS 2013 workshop on Modern Non-parametric Methods in Machine Learning*.
78. A. Krishnamurthy and A. Singh. Low-Rank Matrix and Tensor Completion via Adaptive Sampling. *Annual Conference on Neural Information Processing Systems, NIPS 2013*. (acceptance rate =  $360/1420 = 25.3\%$ ).
79. M. Azizyan, A. Singh and L. Wasserman. Minimax Theory for High-dimensional Gaussian Mixtures with Sparse Mean Separation. *Annual Conference on Neural Information Processing Systems, NIPS 2013*. (acceptance rate =  $360/1420 = 25.3\%$ ).
80. S. Balakrishnan, S. Narayanan, A. Rinaldo, A. Singh and L. Wasserman. Cluster Trees on Manifolds. *Annual Conference on Neural Information Processing Systems, NIPS 2013*. (acceptance rate =  $360/1420 = 25.3\%$ ).
81. J. Sharpnack, A. Krishnamurthy and A. Singh. Near-optimal Anomaly Detection in Graphs using Lovasz Extended Scan Statistic. *Annual Conference on Neural Information Processing Systems, NIPS 2013*. (acceptance rate =  $360/1420 = 25.3\%$ ).



82. A. Krishnamurthy, J. Sharpnack and A. Singh. Recovering Graph-Structured Activations using Adaptive Compressive Measurements. *Asilomar Conference on Signals, Systems, and Computers*, 2013, *invited paper, best student paper award*.
83. A. Ramdas and A. Singh. Algorithmic Connections between Active Learning and Stochastic Convex Optimization. *Algorithmic Learning Theory*, ALT 2013. *Preliminary version appeared in NIPS 2013 workshop on Optimization for Machine Learning and an abridged version in IEEE Global Conference on Signal and Information Processing GlobalSIP 2013*.
84. A. Ramdas and A. Singh. Optimal rates for stochastic convex optimization under Tsybakov noise condition. *International Conference on Machine Learning*, ICML 2013. (acceptance rate: 283/1204 = 24%; oral presentation = 143/1204 = 12%)
85. J. Sharpnack, A. Krishnamurthy and A. Singh. Detecting Activations over Graphs using Spanning Tree Wavelet Bases. *International Conference on Artificial Intelligence and Statistics*, AISTATS 2013. (acceptance rate 71/211 = 33.6%; oral presentation 24/211 = 11.3%)
86. J. Sharpnack, A. Rinaldo and A. Singh. Changepoint Detection over Graphs with the Spectral Scan Statistic. *International Conference on Artificial Intelligence and Statistics*, AISTATS 2013. (acceptance rate 71/211 = 33.6%) *A summary appeared in IEEE Global Conference on Signal and Information Processing, GlobalSIP 2013*.
87. B. Poczos, A. Rinaldo, A. Singh and L. Wasserman. Distribution-free Distribution Regression. *International Conference on Artificial Intelligence and Statistics*, AISTATS 2013. (acceptance rate 71/211 = 33.6%; oral presentation 24/211 = 11.3%)
88. M. Azizyan and A. Singh. Subspace detection of high-dimensional vectors using compressive sampling. *IEEE Statistical Signal Processing Workshop, SSP 2012*.
89. A. Singh, A. Krishnamurthy, S. Balakrishnan and M. Xu. Completion of high-rank ultrametric matrices using selective entries. *International Conference on Signal Processing and Communications*, SPCOM 2012, *invited paper*.
90. A. Krishnamurthy, S. Balakrishnan, M. Xu and A. Singh. Efficient Active Algorithms for Hierarchical Clustering. *International Conference on Machine Learning*, ICML 2012. (acceptance rate 243/890 = 27.3%)
91. J. Sharpnack, A. Rinaldo and A. Singh. Sparsistency of the Edge Lasso over Graphs. *International Conference on Artificial Intelligence and Statistics*, AISTATS 2012. (acceptance rate < 134/400 = 33.5%)
92. S. Balakrishnan, A. Rinaldo, D. Sheehy, A. Singh and L. Wasserman. Minimax Rates for Homology Inference. *International Conference on Artificial Intelligence and Statistics*, AISTATS 2012. (acceptance rate < 134/400 = 33.5%; oral presentation < 24/400 = 6%)
93. A. Krishnamurthy and A. Singh. Robust Multi-Source Network Tomography using Selective Probes. *IEEE International Conference on Computer Communications*, INFOCOM 2012. (acceptance rate 278/1547 = 18%)
94. S. Balakrishnan, M. Xu, A. Krishnamurthy and A. Singh. Noise Thresholds for Spectral Clustering. *Annual Conference on Neural Information Processing Systems*, NIPS 2011. (acceptance rate 305/1400=22%, spotlight 46/1400 = 3.3%)

95. M. Kolar, S. Balakrishnan, A. Rinaldo and A. Singh. Minimax Localization of Structural Information in Large Noisy Matrices. *Annual Conference on Neural Information Processing Systems, NIPS 2011*. (acceptance rate 305/1400=22%, spotlight 46/1400 = 3.3%)
96. B. Eriksson, G. Dasarathy, A. Singh and R. Nowak. Active Clustering: Robust and Efficient Hierarchical Clustering using Adaptively Selected Similarities. *International Conference on Artificial Intelligence and Statistics, AISTATS 2011*. (acceptance rate 77/272 = 28.3%)
97. J. Sharpnack and A. Singh. Identifying Graph-structured Activation Patterns in Networks. *Annual Conference on Neural Information Processing Systems, NIPS 2010*. (acceptance rate 293/1219 = 24%; oral presentation: 20/1219 = 1.6%)
98. A. Singh, R. Nowak and R. Calderbank. Detecting Weak but Hierarchically-Structured Patterns in Networks. *International Conference on Artificial Intelligence and Statistics, AISTATS 2010*. (acceptance rate 125/308 = 40.6%; oral presentation: 24/308 = 7.8%)
99. A. Goldberg, X. Zhu, A. Singh, Z. Xu and R. Nowak. Multi-Manifold Semi-Supervised Learning. *International Conference on Artificial Intelligence and Statistics, AISTATS 2009*. (acceptance rate 84/210 = 40%).
100. A. Singh, R. Nowak and X. Zhu. Unlabeled data: Now it helps, now it doesn't. *Annual Conference on Neural Information Processing Systems, NIPS 2008*. (acceptance rate 250/1022 = 24.5%; oral presentation: 28/1022 = 2.7%)
101. A. Singh, C. Scott and R. Nowak. Adaptive Hausdorff Estimation of Density Level Sets. *Conference on Learning Theory, COLT 2008*. (acceptance rate 44/126 = 34.9%).
102. Z. Harmany, R. Willett, A. Singh and R. Nowak. Controlling the error in fMRI: Hypothesis testing or Set estimation? *IEEE International Symposium on Biomedical Imaging, ISBI 2008*.
103. P. Ramanathan and A. Singh. Delay-differentiated Gossiping in Delay Tolerant Networks. *IEEE International Conference on Communications, ICC 2008*.
104. A. Singh, R. Nowak and P. Ramanathan. Active Learning for Adaptive Mobile Sensing Networks. *ACM/IEEE International Conference on Information Processing in Sensor Networks, IPSN 2006*.
105. M. Rabbat, J. Haupt, A. Singh and R. Nowak. Decentralized Compression and Predistribution via Randomized Gossiping. *ACM/IEEE International Conference on Information Processing in Sensor Networks, IPSN 2006*.
106. A. Singh, P. Ramanathan and B. D. Van Veen. Spatial Reuse through Adaptive Interference Cancellation in Multi-Antenna Wireless Ad Hoc Networks. *IEEE Global Telecommunications Conference, GLOBECOM 2005*.

**Book Section:**

107. A. Singh, J. Scharer and J. Booske. Active Techniques in How to Achieve Linear Amplification. *Modern Microwave and Millimeter-Wave Power Electronics, John Wiley and IEEE Press, April 2005*.

**Technical Reports/ArXived papers:**

108. I. Stelmakh, C. Rastogi, N. Shah, A. Singh and H. Daume III. A Large Scale Randomized Controlled Trial on Herding in Peer-Review Discussions. <https://arxiv.org/pdf/2011.15083.pdf>.

109. S. Chen, R. Varma, A. Singh, and J. Kovačević. Signal representations on graphs: Tools and applications. <http://arxiv.org/abs/1512.05406>.
110. A. Ramdas, S. J. Reddi, B. Poczos, A. Singh and L. Wasserman. Adaptivity and Computation-Statistics Tradeoffs for Kernel and Distance based High-dimensional Two Sample Testing. <http://arxiv.org/abs/1508.00655>.
111. M. Azizyan, Y.-C. Chen, A. Singh and L. Wasserman. Risk Bounds For Mode Clustering. <http://arxiv.org/abs/1505.00482>.
112. L. Wasserman, M. Azizyan and A. Singh. Feature Selection For High-Dimensional Clustering. <http://arxiv.org/abs/1406.2240>.
113. A. Krishnamurthy and A. Singh. On the Power of Adaptivity in Matrix Completion and Approximation. *A preliminary version appeared in NIPS 2013 conference*. <http://arxiv.org/abs/1407.3619>.
114. S. Balakrishnan, A. Rinaldo, A. Singh and L. Wasserman. Tight Lower Bounds for Homology Inference. <http://arxiv.org/abs/1307.7666>.
115. A. Singh, R. Nowak and X. Zhu. Finite sample analysis of semi-supervised learning. Technical Report ECE-08-03, Department of Electrical and Computer Engineering, University of Wisconsin - Madison.

**Non/Lightly peer-reviewed Conference papers:**

116. X. Ding, G. Atulya, A. Singh, A. Davis, and S. Fazzio. Evidential Reasoning with Expert-Guided Machine Learning. *NeurIPS workshop on Human And Machine in-the-Loop Evaluation and Learning Strategies*, HAMLETS, 2020.
117. S. S Du, Y. Xu, Y. Li, H. Zhang, A. Singh and P. Grover. Novel Quantization Strategies for Linear Prediction with Guarantees. *ICML workshop on On Device Intelligence*, 2016.
118. Y. Wang and A. Singh. Minimax Linear Regression under Measurement Constraints. *ICML workshop on Data-efficient Machine Learning*, 2016.
119. S. Mowlaei, A. Singh and A. Ghuman. Frequency bands are an organizational force of intrinsic brain networks. *Society for Neuroscience*, 2016.
120. M. Clute, A. Singh, B. Poczos and T. Verstynen. The predictive value of functional connectivity. *Annual Meeting of the Organization for Human Brain Mapping*, OHBM 2014.
121. M. Azizyan, A. Singh, and W. Wu. Interpretability and Informativeness of Clustering Methods for Exploratory Analysis of Clinical Data. *2nd NIPS Workshop on Machine Learning for Clinical Data Analysis, Healthcare and Genomics*, 2014.
122. S. Balakrishnan, M. Kolar, A. Rinaldo, A. Singh, and L. Wasserman. Statistical and computational tradeoffs in biclustering. *NIPS 2011 Workshop on Computational Trade-offs in Statistical Learning*.
123. A. Singh, J. E. Scharer, J. G. Wöhlbier and J. H. Booske. Sensitivity of Harmonic Injection and its Spatial Evolution for Nonlinear Distortion Suppression in a TWT. *IEEE International Vacuum Electronics Conference*, IVEC 2004.
124. A. Singh, J. G. Wöhlbier, J. E. Scharer and J. H. Booske. Injection Schemes for TWT Linearization. *IEEE International Vacuum Electronics Conference*, IVEC 2003.

125. J. G. Wöhlbier, M. C. Converse, J. Plouin, A. Rawal, A. Singh, J. H. Booske. LATTE/MUSE numerical suite: An Open Source Teaching and Research Code for Traveling Wave Tube Amplifiers. *IEEE International Conference on Plasma Science, ICOPS 2003*.
126. J. G. Wöhlbier, J. H. Booske, I. Dobson, A. Singh, J. E. Scharer. A New look at the Nonlinear Physics of Traveling Wave Tubes. *American Physical Society Annual Meeting, Division of Plasma Physics, APS-DPP 2003*.
127. A. Singh, J. E. Scharer, M. Wirth, S. Bhattacharjee and J. H. Booske. Intermodulation Suppression in a Broad Band TWT. *IEEE International Vacuum Electronics Conference, IVEC 2002*.
128. M. Converse, A. Singh, J. Scharer, M. Wirth, S. Bhattacharjee, J. Booske, C. Armstrong. Hot Phase Velocity Measurements and Modeling for a Broad Band TWT. *International Vacuum Electronics Conference, IVEC 2002*.
129. A. Singh, J. Scharer, M. Wirth, S. Bhattacharjee, J. Booske. Investigations of various Techniques for Intermodulation Suppression in a TWT Amplifier. *American Physical Society Annual Meeting, Division of Plasma Physics, APS-DPP 2002*.
130. M. A. Wirth, J. E. Scharer, J. H. Booske, M. C. Converse, A. Singh, J. G. Wöhlbier, C. Armstrong. Investigations of Non-Linear Spectral Growth in a Broadband Traveling Wave Tube Amplifier. *American Physical Society Annual Meeting, APS 2001*.

#### **Sponsored Projects:**

- Title: AI Institute for Resilient Agriculture  
 PI: G. Kantor (CMU PI)  
 Sponsor: National Science Foundation  
 Amount: \$7,500,000 (CMU portion)  
 Duration: 2022-2026
- Title: Learning the Initial Conditions of the Universe  
 PI: A. Singh (CMU PI)  
 Sponsor: Simons Foundation  
 Amount: \$796,198 (CMU portion)  
 Duration: 2021-2025
- Title: Stimulating Collaborative Advances Leveraging Expertise in the Mathematical and Scientific Foundations of Deep Learning  
 PI: A. Singh (CMU PI)  
 Sponsor: National Science Foundation (NSF), DMS2134133  
 Amount: \$449,998 (CMU portion)  
 Duration: 2021-2024
- Title: Using out-of-sample regularization of physics-informed neural networks to speed up computational fluid dynamics  
 PI: A. Davis (PI)  
 Sponsor: Carnegie Bosch Institute  
 Amount: \$111,032  
 Duration: 2021-2022

- Title: Knowing What You Don't Know: Quantifying, Reasoning About, and Reducing the Effect of Uncertainty in Modern Learning Technique  
 PI: A. Singh & Z. Lipton (CMU PIs)  
 Sponsor: Software Engineering Institute  
 Amount: \$280,000 (CMU portion - year 1)  
 Duration: 2020-2023
- Title: Artificial Intelligence Enabled Additive Manufacturing: Enhancing Expeditionary Manufacturing Capabilities up to the Point-of-Need for the US Army  
 PI: J. Beuth  
 Sponsor: Army Research Laboratory  
 Amount: \$24,968,428  
 Duration: 2020-2025
- Title: ML-Driven Search for Colloidal CdS Clusters Based Quantum Dots with Desired Absorption Spectra  
 PI: A. Singh  
 Sponsor: Air Force Research Laboratory  
 Amount: \$49,995  
 Duration: 2020-2021
- Title: Data-Driven Discovery of Optimized Multifunctional Material Systems Center of Excellence (D3OM2S CoE)  
 PI: L. Holm  
 Sponsor: Air Force Research Laboratory  
 Amount: \$5,000,000  
 Duration: 2019-2024
- Title: Biobehavioral Studies of Cardiovascular Disease  
 Sponsor: University of Pittsburgh / National Institutes of Health  
 PI: T. Verstynen  
 Amount: \$1,099,199  
 Duration: 2018-2023
- Title: Integrated Machine Learning/Physics Based Modeling for Industrial Internet of Things  
 PI: A. Davis  
 Sponsor: Lockheed Martin  
 Amount: \$568,593  
 Duration: 2019-2021
- Title: CIF: Medium: Foundations of Learning from Paired Comparisons and Direct Queries  
 PI: N. Shah  
 Sponsor: National Science Foundation (NSF), CCF-1763734  
 Amount: \$1,199,145  
 Duration: 2018-2022
- Title: AI driven investigation of the physics of field-matter coupling for materials synthesis  
 PI: A. Singh  
 Sponsor: Defense Advanced Research Projects Agency (DARPA), HR00111990030  
 Amount: \$995,723  
 Duration: 2018-2020

- Title: Research in Applications for Learning Machines (REALM)  
 PI: A. Singh  
 Sponsor: Northrup Grumman Corporation  
 Amount: \$192,500  
 Duration: 2018-2020
- Title: Additive Manufacturing Part Candidate Determination and Business Case Analysis Model  
 PI: E. Fuchs  
 Sponsor: The National Center for Defense Manufacturing and Machining (NCDMM)  
 Amount: \$210,000  
 Duration: 2019-2020
- Title: Interactive Learning from Sparse and Diverse Feedback  
 PI: A. Singh  
 Sponsor: Air Force Research Lab (AFRL), FA8750-17-2-0212  
 Amount: \$619,643  
 Duration: 2017-2019
- Title: Launching the Additive Manufacturing of Ceramics using Machine Learning  
 PI: A. Singh  
 Sponsor: Manufacturing Futures Initiative  
 Amount: \$182,568  
 Duration: 2018-2019
- Title: Accelerating MAM Commercialization and Military Readiness: Expert guided machine learning to identify candidate parts and subassemblies for additive manufacturing  
 PI: A. Davis  
 Sponsor: Manufacturing Futures Initiative  
 Amount: \$177,779  
 Duration: 2018-2019
- Title: Construction of a High-Resolution Human Tractography Atlas and Its Related Toolbox  
 PI: T. Verstynen  
 Sponsor: University of Pittsburgh / National Institutes of Health  
 Amount: \$13,110  
 Duration: 2018-2019
- Title: Modeling Multi-Scale Complex Phenomena Using Graphical Models and Deep Nets  
 PI: A. Singh and R. Salakhutdinov  
 Sponsor: Defense Advanced Research Projects Agency (DARPA), D17AP00001  
 Amount: \$391,045  
 Duration: 2016-2018
- Title: CIF:Medium:Signal representation, sampling and recovery on graphs  
 PI: J. Kovačević  
 Sponsor: National Science Foundation (NSF), CCF-1563918  
 Amount: \$690,000  
 Duration: 2016-2019

- Title: Active identification of complex visual features for natural scene perception  
 PI: A. Singh  
 Sponsor: ProSEED/BrainHub Seed grant  
 Amount: \$76,193  
 Duration: 2016-2017
- Title: Expert-guided machine learning for nanomaterial discovery  
 PI: B. Reeja Jayan  
 Sponsor: CIT Incubation Seed grant  
 Amount: \$144,661  
 Duration: 2016-2018
- Title: QuBBD: Collaborative Research: Personalized Predictive Neuromarkers for Stress-Related Health Risks  
 PI: A. Singh  
 Sponsor: National Science Foundation (NSF), DMS-1557572  
 Amount: \$91,165  
 Duration: 2015-2016
- Title: ConnPort: A standardized interface accessing human connectome data  
 PI: T. Verstynen  
 Sponsor: ProSEED/BrainHub Seed grant  
 Amount: \$45,000  
 Duration: 2015-2016
- Title: Towards Useful Benchmarking and Understanding of Energy Use in Urban Facilities  
 PI: B. Akinci  
 Sponsor: Metro21 grant  
 Amount: \$35,000  
 Duration: 2015
- Title: Young Investigator Award: Compressive and adaptive measurement design for inference problems in multi-attribute large-scale graphs  
 PI: A. Singh  
 Sponsor: Air Force Office of Scientific Research (AFOSR), FA9550-14-1-0285  
 Amount: \$367,822  
 Duration: 2014-2017
- Title: CAREER: Distilling information structure from big and dirty data: Efficient learning of clusters and graphs in modern datasets.  
 PI: A. Singh  
 Sponsor: National Science Foundation (NSF), IIS-1252412  
 Amount: \$500,000  
 Duration: 2013-2018
- Title: BIGDATA: Distribution-based machine learning for high dimensional datasets.  
 PI: A. Singh  
 Sponsor: National Science Foundation (NSF), IIS-1247658  
 Amount: \$1,000,000  
 Duration: 2013-2015

- Title: 15th IMS New Researchers Conference.  
 PI: A. Singh  
 Sponsor: National Institute of Health (NIH)/NIBIB,  
 Amount: \$15,000  
 Duration: 2013-2014
- Title: 15th IMS New Researchers Conference.  
 PI: A. Singh  
 Sponsor: National Science Foundation (NSF), DMS-1301845  
 Amount: \$25,000  
 Duration: 2013-2014
- Title: Spectral Methods for Active Clustering and Bi-Clustering.  
 PI: A. Singh  
 Sponsor: National Science Foundation (NSF), IIS-1116458  
 Amount: \$372,765 (+ \$18,000 REU-Supplement)  
 Duration: 2011-2014
- Title: Resource-constrained data collection and fusion for identifying weak distributed patterns in networks.  
 PI: A. Singh  
 Sponsor: Air Force Office of Scientific Research (AFOSR), FA9550-10-1-0382  
 Amount: \$364,734  
 Duration: 2010-2013
- Title: Using Non-Local Connectivity Information to Identify Nascent Disease Outbreaks.  
 PI: A. Singh  
 Sponsor: NIH MIDAS National Center of Excellence at Univ. Pittsburgh, 5U54GM088491-03  
 Amount: \$20,000  
 Duration: 2011-2012