STEFANIE JEGELKA
CURRICULUM VITAE

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RESEARCH INTERESTS

My research interests lie in machine learning. In particular, my research aims to expose and exploit *combinatorial, geometric and algebraic* structure in machine learning problems, to design and analyze models that represent important interdependencies in data, and to develop *robust, resource-efficient, reliable* learning and optimization algorithms. This includes learning with discrete objects, such as graphs or sets; learning with symmetries; discrete probability; learning with limited supervision, and the interplay of discrete and continuous optimization. I also collaborate with researchers in biology, materials science, ocean engineering and sustainability/power grids.

POSITIONS HELD

Alexander von Humboldt Professor, since Oct 2023
Dept of Computer Science, TU Munich

X-Consortium Career Development Associate Professor (with tenure), since July 2022
(on leave since Oct 2023)
Dept. of EECS, MIT

X-Consortium Career Development Associate Professor, July 2019 – July 2022
Dept. of EECS, MIT

X-Consortium Career Development Assistant Professor, Jan 2015 – July 2019
Dept. of EECS, MIT

Postdoctoral Researcher, May 2012–Dec 2014
Dept of EECS, University of California Berkeley
Advisors: Michael I. Jordan, Trevor Darrell

EDUCATION

Ph.D. (Dr.sc. ETH Zürich) in **Computer Science**, Feb 2008 – March 2012
Max Planck Institute for Intelligent Systems, Tübingen, Germany and ETH Zurich, Switzerland
Dissertation Title: *Combinatorial Problems with Submodular Coupling in Machine Learning and Computer Vision*
Advisors: Jeff Bilmes, Bernhard Schölkopf, Andreas Krause

Diplom in **Bioinformatics** with distinction, Dec 2007
University of Tübingen, Germany
Thesis: *Statistical Learning Theory Approaches to Clustering*
Thesis advisors: Ulrike von Luxburg, Michael Kaufmann

Exchange student, Aug 2003 - May 2004
The University of Texas at Austin, Dept. of Computer Science

VISITING POSITIONS AND CONSULTING

Advisory Board
macro-eyes health/Pendulum, since Aug 2020

Visiting Professor
ETH Zürich, Dept. of CS, July-Aug 2019

Consulting Researcher
Microsoft Research New England; Dec 2017–Dec 2018

Invited Long-Term Participant
Simons Institute for the Theory of Computing, Program on *Bridging Continuous and Discrete Optimization*; Fall 2017

Invited Long-Term Participant
Simons Institute for the Theory of Computing, Program on *Foundations of Machine Learning*; Spring 2017

OTHER RESEARCH EXPERIENCE

Research Intern, Microsoft Research, Redmond; June-Sept 2011
Advisors: Eric Horvitz, Ashish Kapoor

Research Assistant, Max Planck Institute for Biological Cybernetics, Germany; 2005-2007
Advisors: Arthur Gretton, Ulrike von Luxburg

Research Intern, Georgetown University, Dept. of Neuroscience, Washington D.C.; May-Oct 2004
Advisor: Maximilian Riesenhuber

Conference Course, The University of Texas at Austin, Dept. of Computer Science; Jan-May 2004
Advisors: James A. Bednar, Risto Miikkulainen

SELECTED HONORS, AWARDS AND FELLOWSHIPS

Invited Sectional Lecture, International Congress of Mathematicians (ICM), 2022

Alexander von Humboldt Professorship, 2021

Two Sigma Faculty Research Award, 2020

Sloan Research Fellowship, 2018

Joseph A Martore Award (for Exceptional Contributions to Education in the MIT Institute for Data, Systems and Society), 2017

DARPA Young Faculty Award (YFA), 2017

Adobe Research Award, 2017

Google Faculty Research Award, 2016 & 2021

NSF CAREER Award, 2016

German Pattern Recognition Award (Deutscher Mustererkennungspreis), 2015

ICML Best Paper Award (International Conference on Machine Learning), 2013

Google Anita Borg Europe Fellowship, 2008

Diplom with Distinction, University of Tübingen, 2007

Member of the Scientific College for Neuroscience, German National Academic Foundation, 2005-2007

Honors List, The University of Texas at Austin, Dec 2003

Scholar of the German National Academic Foundation (Studienstiftung des Deutschen Volkes), Feb 2003-Aug 2007

PUBLICATIONS

In machine learning, the main conferences are very competitive and the main venues of publication. They are equivalent to good journal publications in other fields.

Journal Papers

1. E. Kim, Z. Jensen, A. van Grootel, K. Huang, M. Staib, S. Mysore, H.-S. Chang, E. Strubell, A. McCallum, S. Jegelka, E. Olivetti. Inorganic Materials Synthesis Planning with Literature-Trained Neural Networks. *Journal of Chemical Information and Modeling*, 2020.

2. M. Staib and S. Jegelka. Robust Budget Allocation via Continuous Submodular Functions. *Applied Mathematics and Optimization, Special issue on Optimization for Data Sciences*. 2019.

3. G. Shulkind, S. Jegelka and G.W. Wornell. Sensor Array Design Through Submodular Optimization. *IEEE Transactions on Information Theory*, 2018.

4. E. Kim, K. Huang, S. Jegelka and E. Olivetti. Virtual Screening of Inorganic Materials Synthesis Parameters with Deep Learning. *npj Computational Materials*, 3(53), 2017.

5. S. Jegelka and J. Bilmes. Graph Cuts with Interacting Edge Costs – Examples, Approximations, and Algorithms. *Mathematical Programming Series A* 162, pp. 241-282, 2017.

6. S. Jegelka, A. Kapoor and E. Horvitz. An Interactive Approach to Solving Correspondence Problems. *International Journal of Computer Vision*, 2013.

7. H. Shen, S. Jegelka and A. Gretton. Fast Kernel-based Independent Component Analysis. *IEEE Transactions on Signal Processing* 57(9), pp. 3498–3511, 2009.

8. S. Jegelka, J. A. Bednar and R. Miikkulainen. Prenatal Development of Ocular Dominance in a Self-organizing Model of V1. *Neurocomputing* 69, pp. 1291–1296, 2006. Presented at the *Computational Neuroscience Meeting*, 2005.

Conference Papers and Book Chapters

9. B. Tahmasebi, S. Jegelka. The Exact Sample Complexity Gain from Invariances for Kernel Regression. Neural Information Processing Systems (NeurIPS), 2023. **Spotlight**

10. D. Lim, J. Robinson, S. Jegelka, H. Maron. Expressive Sign Equivariant Networks for Spectral Geometric Learning. Neural Information Processing Systems (NeurIPS), 2023. **Spotlight**

11. T. Le, S. Jegelka. Limits, approximation and size transferability for GNNs on sparse graphs via graphops. Neural Information Processing Systems (NeurIPS), 2023.

12. K. Gatmiry, Z. Li, T. Ma, S. J. Reddi, S. Jegelka, C.-Y. Chuang. What is the Inductive Bias of Flatness Regularization? A Study of Deep Matrix Factorization Models. Neural Information Processing Systems (NeurIPS), 2023.

13. M. Murphy, S. Jegelka, E. Fraenkel, T. Kind, D. Healey, T. Butler. Efficiently predicting high resolution mass spectra with graph neural networks. *International Conference on Machine Learning (ICML)*, 2023.

14. C.-Y. Chuang, S. Jegelka, D. Alvarez-Melis. InfoOT: Information Maximizing Optimal Transport. *International Conference on Machine Learning (ICML)*, 2023.

15. D. Lim, J. D. Robinson, L. Zhao, T. Smidt, S. Sra, H. Maron, S. Jegelka. Sign and Basis Invariant Networks for Spectral Graph Representation Learning. *International Conference on Learning Representations (ICLR)*, 2023. **Spotlight/notable-top-25%**

16. B. Tahmasebi, D. Lim, S. Jegelka. The Power of Recursion in Graph Neural Networks for Counting Substructures. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2023. **Oral Presentation** (top 1.9% of submissions)

17. N. Chandramoorthy, A. Loukas, K. Gatmiry, S. Jegelka. On the generalization of learning algorithms that do not converge. *Neural Information Processing Systems (NeurIPS)*, 2022.

18. N. Karalias, J. Robinson, A. Loukas, S. Jegelka. Neural Set Function Extensions: Learning with Discrete Functions in High Dimensions. *Neural Information Processing Systems (NeurIPS)*, 2022.

19. C.-Y. Chuang, S. Jegelka. Tree Mover's Distance: Bridging Graph Metrics and Stability of Graph Neural Networks. *Neural Information Processing Systems (NeurIPS)*, 2022.

20. M. Murphy, S. Jegelka, E. Fraenkel. Self-supervised learning of cell type specificity from immunohistochemical images. *International Conference on Intelligent Systems for Molecular Biology (ISMB)*, 2022.

21. C.-Y. Chuang, R. D. Hjelm, V. Vineet, N. Joshi, A. Torralba, S. Jegelka, Y. Song. Robust contrastive learning against noisy views. *IEEE Conference of Computer Vision and Pattern Recognition (CVPR)*, 2022.

22. S. Jegelka. Theory of Graph Neural Networks: Representation and Learning. *Proc. of the International Congress of Mathematicians (ICM)*, 2022.

23. T. Le, S. Jegelka. Training invariances and the low-rank phenomenon: beyond linear networks. *International Conference on Learning Representations (ICLR)*, 2022.

24. K. Gatmiry, S. Jegelka, J. Kelner. Optimization and Adaptive Generalization of Three layer Neural Networks. *International Conference on Learning Representations (ICLR)*, 2022.

25. C.-Y. Chuang, Y. Mroueh, K. Greenewald, A. Torralba, S. Jegelka. Measuring Generalization with Optimal Transport. *Neural Information Processing Systems (NeurIPS)*, 2021. **Spotlight**

26. A. Gotovos, R. Burkholz, J. Quackenbush, S. Jegelka. Scaling up Continuous-Time Markov Chains Helps Resolve Underspecification. *Neural Information Processing Systems (NeurIPS)*, 2021.

27. J. Robinson, L. Sun, K. Yu, K. Batmanghelich, S. Jegelka, S. Sra. Can contrastive learning avoid shortcut solutions? *Neural Information Processing Systems (NeurIPS)*, 2021.

28. A. Loukas, M. Poiitis, S. Jegelka. What training reveals about neural network complexity. *Neural Information Processing Systems (NeurIPS)*, 2021.

29. K. Xu, M. Zhang, S. Jegelka, K. Kawaguchi. Optimization of Graph Neural Networks: Implicit Acceleration by Skip Connections and More Depth. *International Conference on Machine Learning (ICML)*, 2021.

30. A. Liao, H. Zhao, K. Xu, T. Jaakkola, G. Gordon, S. Jegelka, R. Salakhutdinov. Information Obfuscation of Graph Neural Networks. *International Conference on Machine Learning (ICML)*, 2021.

31. K. Xu, M. Zhang, J. Li, S. S. Du, K. Kawarabayashi, S. Jegelka. How Neural Networks Extrapolate: From Feedforward to Graph Neural Networks. *International Conference on Learning Representations (ICLR)*, 2021. **Oral Presentation**.

32. J. Robinson, C.-Y. Chuang, S. Sra, S. Jegelka. Contrastive Learning with Hard Negative Samples. *International Conference on Learning Representations (ICLR)*, 2021.

33. C.-Y. Chuang, J. Robinson, L. Yen-Chen, A. Torralba, S. Jegelka. Debiased Contrastive Learning. *Neural Information Processing Systems (NeurIPS)*, 2020. **Spotlight**.

34. K. Gatmiry, M. Aliakbarpour, S. Jegelka. Testing Determinantal Point Processes. *Neural Information Processing Systems (NeurIPS)*, 2020. **Spotlight**.

35. Y. Arjevani, J. Bruna, B. Can, M. Gürbüzbalaban, S. Jegelka, H. Lin. IDEAL: Inexact DEcentralized Accelerated Augmented Lagrangian Method. *Neural Information Processing Systems (NeurIPS)*, 2020. **Spotlight**.

36. S. Curi, K.Y. Levy, S. Jegelka, A. Krause. Adaptive Sampling for Stochastic Risk-Averse Learning. *Neural Information Processing Systems (NeurIPS)*, 2020.

37. J. Robinson, S. Jegelka, S. Sra. Strength from Weakness: Fast Learning Using Weak Supervision. *International Conference on Machine Learning (ICML)*, 2020.

38. V. K. Garg, S. Jegelka, T. Jaakkola. Generalization and Representational Limits of Graph Neural Networks. *International Conference on Machine Learning (ICML)*, 2020.

39. C.-Y. Chuang, A. Torralba, S. Jegelka. Estimating Generalization under Distribution Shifts via Domain-Invariant Representations. *International Conference on Machine Learning (ICML)*, 2020.

40. M. El Halabi, S. Jegelka. Minimizing approximately submodular functions. *International Conference on Machine Learning (ICML)*, 2020.

41. J. Zhang, H. Lin, S. Jegelka, A. Jadbabaie, S. Sra. On Complexity of Finding Stationary Points of Nonsmooth Nonconvex Functions. *International Conference on Machine Learning (ICML)*, 2020.

42. J. Kirschner, I. Bogunovic, S. Jegelka, A. Krause. Distributionally Robust Bayesian Optimization. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2020.

43. K. Xu, J. Li, M. Zhang, S. Du, K. Kawarabayashi and S. Jegelka. What Can Neural Networks Reason About? *International Conference on Learning Representations (ICLR)*, 2020. **Spotlight**

44. J. Robinson, S. Sra and S. Jegelka. Flexible Modeling of Diversity with Strongly Log-Concave Distributions. *Neural Information Processing Systems (NeurIPS)*, 2019.

45. M. Staib and S. Jegelka. Distributionally Robust Optimization and Generalization in Kernel Methods. *Neural Information Processing Systems (NeurIPS)*, 2019.

46. M. Zhang, K. Xu, K. Kawarabayashi, S. Jegelka and J. Boyd-Graber. Are Girls Neko or Shojo? Cross-Lingual Mapping of Non-Isomorphic Embedding with Iterative Normalization. *ACL Short paper*, 2019.

47. C. Bunne, D. Alvarez Melis, A. Krause and S. Jegelka. Learning Generative Models across Incomparable Spaces. *International Conference on Machine Learning (ICML)*, 2019.

48. D. Alvarez Melis, S. Jegelka and T. Jaakkola. Towards Optimal Transport with Global Invariances. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019.

49. M. Staib, B. Wilder and S. Jegelka. Distributionally Robust Submodular Maximization. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2019.

50. K. Xu, W. Hu, J. Leskovec and S. Jegelka. How Powerful are Graph Neural Networks? *International Conference on Learning Representations (ICLR)*, 2019. **Oral Presentation**

51. H. Lin and S. Jegelka. ResNet with one-neuron hidden layers is a Universal Approximator. *Neural Information Processing Systems (NIPS)*, 2018. **Spotlight**

52. I. Bogunovic, J. Scarlett, S. Jegelka, V. Cevher. Adversarially Robust Optimization with Gaussian Processes. *Neural Information Processing Systems (NIPS)*, 2018. **Spotlight**

53. Z. Mariet, S. Sra, S. Jegelka. Exponentiated Strongly Rayleigh Distributions. *Neural Information Processing Systems (NIPS)*, 2018.

54. J. Djolonga, S. Jegelka and A. Krause. Provable Variational Inference for Constrained Log-Submodular Models. *Neural Information Processing Systems (NIPS)*, 2018.

55. A. Gkotovos, S. Jegelka, H. Hassani and A. Krause. Discrete Sampling using Semigradient-based Product Mixtures. *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2018. **Oral presentation**

56. K. Xu, C. Li, Y. Tian, T. Sonobe, K. Kawarabayashi and S. Jegelka. Representation Learning on Graphs with Jumping Knowledge Networks. *International Conference on Machine Learning (ICML)*, 2018. **Long talk**

57. D. Alvarez-Melis, T.S. Jaakkola and S. Jegelka. Structured Optimal Transport. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018. **Oral presentation**

58. Z. Wang, C. Gehring, P. Kohli and S. Jegelka. Batched Large-scale Bayesian Optimization in High-dimensional Spaces. *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.

59. B. Mirzasoleiman, S. Jegelka and A. Krause. Streaming Non-monotone Submodular Maximization: Personalized Video Summarization on the Fly. *AAAI Conference on Artificial Intelligence (AAAI)*, 2018.

60. M. Staib, S. Claici, J. Solomon and S. Jegelka. Parallel Streaming Wasserstein Barycenters. *Neural Information Processing Systems (NIPS)*, 2017.

61. C. Li, S. Jegelka, S. Sra. Column Subset Selection via Polynomial Time Dual Volume Sampling. *Neural Information Processing Systems (NIPS)*, 2017.

62. M. Staib, S. Jegelka. Robust Budget Allocation via Continuous Submodular Functions. *International Conference on Machine Learning (ICML)*, 2017.

63. Z. Wang, S. Jegelka. Max-value Entropy Search for Efficient Bayesian Optimization. *International Conference on Machine Learning (ICML)*, 2017.

64. Z. Wang, C. Li, S. Jegelka, P. Kohli. Batched High-dimensional Bayesian Optimization via Structural Kernel Learning. *International Conference on Machine Learning (ICML)*, 2017.

65. H. Song, S. Jegelka, V. Rathod and K. Murphy. Deep Metric Learning via Facility Location. *International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017. **Spotlight**

66. Z. Wang, S. Jegelka, L. P. Kaelbling and T. Lozano-Perez. Focused Model-Learning and Planning for Non-Gaussian Continuous State-Action Systems. *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.

67. G. Shulkind, S. Jegelka and G. W. Wornell. Multiple wavelength sensing array design. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* 2017.

68. C. Li, S. Sra, S. Jegelka. Fast Mixing Markov Chains for Strongly Rayleigh Measures, DPPs, and Constrained Sampling. *Neural Information Processing Systems (NIPS)*, 2016. (covered by MIT News and ACM Technews)

69. J. Djolonga, S. Jegelka, S. Tschiatschek, A. Krause. Cooperative Graphical Models. *Neural Information Processing Systems (NIPS)*, 2016.

70. C. Li, S. Sra, and S. Jegelka. Gaussian quadrature for matrix inverse forms with applications. *International Conference on Machine Learning (ICML)*, 2016.

71. C. Li, S. Jegelka, S. Sra. Fast DPP Sampling for Nyström with Application to Kernel Methods. *International Conference on Machine Learning (ICML)*, 2016.

72. H. Song, Y. Xiang, S. Jegelka and S. Savarese. Deep Metric Learning via Lifted Structured Feature Embedding. *International Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016. **Spotlight**

73. C. Li, S. Jegelka and S. Sra. Efficient Sampling for k-Determinantal Point Processes. *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2016. **Oral presentation**.

74. Z. Wang, B. Zhou and S. Jegelka. Optimization as Estimation with Gaussian Processes in Bandit Settings. *Conference on Artificial Intelligence and Statistics (AISTATS)*, 2016. **Oral presentation**.

75. S. Azadi, J. Feng, S. Jegelka and T. Darrell. Auxiliary Image Regularization for Deep CNNs with Noisy Labels. *International Conference on Learning Representations (ICLR)*, 2016.

76. X. Pan, S. Jegelka, J. Gonzalez, J. Bradley and M.I. Jordan. Parallel Double Greedy Submodular Maximization. *28th Annual Conference on Neural Information Processing Systems (NIPS)*, 2014.

77. R. Nishihara, S. Jegelka and M.I. Jordan. On the Linear Convergence Rate of Decomposable Submodular Function Minimization. *28th Annual Conference on Neural Information Processing Systems (NIPS)*, 2014.

78. A. Prasad, S. Jegelka and D. Batra. Submodular meets Structured: Finding Diverse Subsets in Exponentially-Large Structured Item Sets. *28th Annual Conference on Neural Information Processing Systems (NIPS)*, 2014. **Spotlight**.

79. H. Song, Y.J. Lee, S. Jegelka and T. Darrell. Weakly-supervised Discovery of Visual Pattern Configurations. *28th Annual Conference on Neural Information Processing Systems (NIPS)*, 2014.

80. V. Strnadova, A. Buluc, J. Chapman, J. Gonzalez, S. Jegelka, J. Gilbert, D. Rokhsar and L. Oliker. Efficient and Accurate Clustering for Large-Scale Genetic Mapping. *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, 2014.

81. R. Iyer, S. Jegelka and J. Bilmes. Monotone Closure of Relaxed Constraints in Submodular Optimization: Connections Between Minimization and Maximization. *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2014.

82. H. Song, R. Girshick, S. Jegelka, J. Mairal, Z. Harchaoui and T. Darrell. On learning to localize objects with minimal supervision. *International Conference on Machine Learning (ICML)*, 2014.

83. J. Feng, S. Jegelka and T. Darrell. Learning Scalable Discriminative Attributes with Sample Relatedness. *IEEE Conference of Computer Vision and Pattern Recognition (CVPR)*, 2014. **Oral presentation**.

84. X. Pan, J. Gonzalez, S. Jegelka, T. Broderick and M.I. Jordan. Optimistic Concurrency Control for Distributed Unsupervised Learning. *27th Annual Conference on Neural Information Processing Systems (NIPS)*, 2013.

85. S. Jegelka, F. Bach and S. Sra. Reflection methods for User-Friendly Submodular Optimization. *27th Annual Conference on Neural Information Processing Systems (NIPS)*, 2013.

86. R. Iyer, S. Jegelka and J. Bilmes. Curvature and Optimal Algorithms for Learning and Minimizing Submodular Functions. *27th Annual Conference on Neural Information Processing Systems (NIPS)*, 2013.

87. R. Iyer, S. Jegelka and J. Bilmes. Fast Semidifferential-based Submodular Function Optimization. *30th International Conference on Machine Learning (ICML)*, 2013. **Best Paper Award**.

88. P. Kohli, A. Osokin and S. Jegelka. A Principled Deep Random Field for Image Segmentation. *IEEE Conference of Computer Vision and Pattern Recognition (CVPR)*, 2013.

89. S. Jegelka, H. Lin and J. Bilmes. On Fast Approximate Submodular Optimization. *25th Annual Conference on Neural Information Processing Systems (NIPS)*, 2011.

90. S. Jegelka and J. Bilmes. Online Submodular Minimization for Combinatorial Structures. *28th International Conference on Machine Learning (ICML)*, 2011.

91. S. Jegelka and J. Bilmes. Approximation Bounds for Inference using Cooperative Cut. *28th International Conference on Machine Learning (ICML)*, 2011.

92. S. Jegelka and J. Bilmes. Submodularity beyond Submodular Energies: Coupling Edges in Graph Cuts. *IEEE Conference of Computer Vision and Pattern Recognition (CVPR)*, 2011. **Oral presentation**

93. S. Jegelka, S. Sra and A. Banerjee. Approximation Algorithms for Tensor Clustering. *Algorithmic Learning Theory: 20th International Conference (ALT)*, 2009.

94. S. Nowozin and S. Jegelka. Solution Stability in Linear Programming Relaxations: Graph Partitioning and Unsupervised Learning. *26th International Conference on Machine Learning (ICML), 2009.*

95. S. Jegelka, A. Gretton, B. Schölkopf, B.K. Sriperumbudur and U. von Luxburg. Generalized Clustering via Kernel Embeddings. *KI 2009: Advances in Artificial Intelligence*, 2009.

96. U. von Luxburg, S. Bubeck, S. Jegelka and M. Kaufmann. Consistent Minimization of Clustering Objective Functions. *21st Annual Conference on Neural Information Processing Systems (NIPS)*, 2007.

97. H. Shen, S. Jegelka and A. Gretton. Fast Kernel ICA using an Approximate Newton Method. *11th Conference on Artificial Intelligence and Statistics (AISTATS)*, 2007.

98. S. Jegelka and A. Gretton. Brisk Kernel Independent Component Analysis. In L. Bottou, O. Chapelle, D. DeCoste, J. Weston, editors. *Large Scale Kernel Machines*, pp. 225–250. MIT Press, 2007.

Abstracts and Contributions to Peer-reviewed Workshops

99. D. Lim, J. Robinson, S. Jegelka, H. Maron. Expressive Sign Equivariant Networks for Spectral Geometric Learning. ICML 2023 workshop: TAG in Machine Learning.

100. B. Tahmasebi, S. Jegelka. The Exact Sample Complexity Gain from Invariances for Kernel Regression. ICML 2023 workshop: TAG in Machine Learning.

101. B. Tahmasebi, S. Jegelka. Sample Complexity Bounds for Estimating the Wasserstein Distance under Invariances. ICML 2023 workshop: TAG in Machine Learning.

102. S. Gupta, J. Robinson, D. Lim, S. Villar, S. Jegelka. Learning Structured Representations with Equivariant Contrastive Learning. ICML 2023 workshop: TAG in Machine Learning.

103. D. Lim, J. Robinson, S. Jegelka, Y. Lipman, H. Maron. Expressive Sign Equivariant Networks for Spectral Geometric Learning. ICLR 2023 workshop: Physics4ML, 2023.

104. M. Murphy, K. Yang, S. Jegelka, E. Fraenkel. Learning representations from mass spectra for peptide property prediction. *ICML workshop on Computational Biology*, 2022.

105. B. Tahmasebi, D. Lim, S. Jegelka. The Power of Recursion in Graph Neural Networks for Counting Substructures. *ICML workshop on Topology, Algebra and Geometry in Data Science*, 2022.

106. D. Lim, J. Robinson, L. Zhao, T. Smidt, S. Sra, H. Maron, S. Jegelka. Sign and Basis Invariant Networks for Spectral Graph Representation Learning. *ICLR workshop on Geometric and Topological Representation Learning*, 2022.

107. J. Robinson, L. Sun, K. Yu, K. Batmanghelich, S. Jegelka, S. Sra. Can contrastive learning avoid shortcut solutions? *ICML workshop on Self-Supervised Learning for Reasoning and Perception*, 2021.

108. Z. Mariet, J. Robinson, J. Smith, S. Sra, S. Jegelka. Optimal Batch Variance with Second-Order Marginals. *ICML Workshop on Real World Experiment Design and Active Learning*, 2020.

109. M. El Halabi and S. Jegelka. Minimizing approximately submodular functions. *OPT 2019, Optimization for Machine Learning*, 2019. **Oral presentation**

110. Z. Xu. C. Li and S. Jegelka. Exploring the Robustness of GANs to Internal Perturbations. *ICML workshop on Security and Privacy on Machine Learning*, 2019.

111. C.-Y. Chuang, A. Torralba and S. Jegelka. The Role of Embedding-complexity in Domain-invariant Representations. *ICML workshop on Adaptive and Multitask Learning*, 2019.

112. C. Bunne, D. Alvarez Melis, A. Krause and S. Jegelka. Learning Generative Models Across Incomparable Spaces. *NIPS workshop on Relational Representation Learning*, 2018. **Best Paper Award**

113. M. Staib, B. Wilder and S. Jegelka. Distributionally Robust Submodular Maximization. *ICML Workshop on Modern Trends in Nonconvex Optimization for Machine Learning*, 2018. **Spotlight**.

114. M. Staib and S. Jegelka. Distributionally Robust Deep Learning as a Generalization of Adversarial Training. *NIPS Machine Learning and Computer Security Workshop*, 2017.

115. A. Lenail, L. Schmidt, J. Li, T. Ehrenberger, K. Sachs, S. Jegelka and E. Fraenkel. Graph-Sparse Logistic Regression. *NIPS workshop on Discrete Structure in Machine Learning (DISCML)*, 2017.

116. Z. Wang, C. Gehring, P. Kohli, S. Jegelka. Batched Large-scale Bayesian Optimization in High-dimensional Spaces. *NIPS workshop on Bayesian Optimization (BayesOpt)*, 2017.

117. D. Alvarez Melis, T. Jaakkola and S. Jegelka. Structured Optimal Transport. *NIPS workshop on Optimal Transport and Machine Learning (OTML)*, 2017. **Oral presentation**.

118. M. Cohen, L. Schmidt, C. Hegde, S. Jegelka. Efficiently Optimizing over (Non-Convex) Cones via Approximate Projections. *NIPS workshop on Optimization in Machine Learning (OPTML)*, 2017. **Oral presentation**.

119. M. Staib and S. Jegelka. Wasserstein k-means++ for Cloud Regime Histogram Clustering. *Climate Informatics*, 2017.

120. Z. Wang, B. Zhou and S. Jegelka. Optimization as Estimation with Gaussian Processes in Bandit Settings. *NIPS 2015 workshop on Bayesian Optimization: Scalability and Flexibility*.

121. E. Shelhamer, S. Jegelka and T. Darrell. Communal Cuts. *NIPS 2014 Workshop on Discrete Optimization in Machine Learning*.

122. V. Strnadova, A. Buluç, L. Oliker, J. Gonzalez, S. Jegelka, J. Chapman and J. R. Gilbert. Fast Clustering Methods for Genetic Mapping in Plants. *16th SIAM Conference on Parallel Processing for Scientific Computing (PP14)*, 2014.

123. A. Prasad, S. Jegelka and D. Batra. Submodular Maximization and Diversity in Structured Output Spaces. *NIPS 2013 Workshop on Discrete and Combinatorial Problems in Machine Learning*.

124. R. Iyer, S. Jegelka and J. Bilmes. Mirror-Descent like Algorithms for Submodular Optimization. *NIPS 2012 Workshop on Discrete Optimization in Machine Learning*.

125. P. Kohli, A. Osokin and S. Jegelka. A Principled Deep Random Field for Image Segmentation. *NIPS 2012 Workshop on Discrete Optimization in Machine Learning*.

126. S. Jegelka and J. Bilmes. Multi-label Cooperative Cuts. *CVPR 2011 Workshop on Inference in Graphical Models with Structured Potentials.*

127. S. Jegelka and J. Bilmes. Coupling Edges in Graph Cuts. *SIAM Conference on Optimization*, 2011.

128. S. Jegelka and J. Bilmes. Online Algorithms for Submodular Minimization with Combinatorial Constraints. *NIPS 2010 Workshop on Discrete Optimization in Machine Learning.*

129. S. Jegelka and J. Bilmes. Cooperative Cuts: Graph Cuts with Submodular Edge Weights. *EURO XXIV (24th European Conference on Operational Research)*, 2010.

130. S. Jegelka and J. Bilmes. Notes on Graph Cuts with Submodular Edge Weights. *NIPS 2009 Workshop on Discrete Optimization in Machine Learning.*

131. C. Lippert, O. Stegle, S. Jegelka, Y. Altun and K. M. Borgwardt. Predicting related traits from SNP markers by multi-task learning. *German Conference on Bioinformatics*, 2009.

132. S. Jegelka, A. Gretton and D. Achlioptas. Kernel ICA for Large Scale Problems. *NIPS 2005 Workshop on Large Scale Kernel Machines.*

Technical Reports

133. S. Jegelka and J. Bilmes. Cooperative Cuts for Image Segmentation, UWEETR-1020-0003, University of Washington, 2010.

134. S. Jegelka and J. Bilmes. Cooperative Cuts: Graph Cuts with Submodular Edge Weights. MPI-TR 189, 2010.

135. S. Sra, S. Jegelka and A. Banerjee. Approximation Algorithms for Bregman Clustering, Co-Clustering and Tensor Clustering. MPI-TR 177, 2008.

136. B. Kulis, S. Sra and S. Jegelka. Scalable Semidefinite Programming using Convex Perturbations. TR 07-47, University of Texas at Austin, 2007.

137. H. Shen, S. Jegelka and A. Gretton. Geometric Analysis of Hilbert Schmidt Independence Criterion based ICA contrast function. TR PA006080, NICTA, 2006.

INVITED TALKS AND TUTORIALS

Tutorials and summer school courses

1. S. Jegelka. Graph Neural Networks. Invited lecture at the Eastern European Machine Learning Summer School, July 2023.

2. S. Jegelka. Graph Neural Networks. Invited tutorial at the MINDS TRIPODS winter school on Graph and Deep Learning, Johns Hopkins University, Jan 2021.

3. S. Jegelka. Submodularity and Machine Learning. Invited lecture at the Machine Learning Summer School (MLSS), London, July 2019.

4. S. Sra and S. Jegelka. Negative dependence, stable polynomials and all that. Tutorial at ETH Zurich, July 2019.

5. S. Sra and S. Jegelka. Negative dependence, stable polynomials and all that. Tutorial at the Conference on Neural Information Processing Systems (NeurIPS), Dec 2018.

6. L. Orecchia, M. Fazel and S. Jegelka. Continuous Methods for Discrete Optimization. Invited lectures at the Bridging Continuous and Discrete Optimization Bootcamp, Simons Institute for the Theory of Computing (Program on Bridging Continuous and Discrete Optimization), Berkeley, Aug 2017.

7. S. Jegelka. Submodular Functions and Machine Learning. Invited lectures at the Machine Learning Summer School (MLSS), Tübingen, June 2017.

8. A. Krause and S. Jegelka. Submodularity: Theory and Applications. Invited lectures at the Machine Learning Bootcamp, Simons Institute for the Theory of Computing (Program on Foundations of Machine Learning), Berkeley, Jan 2017.

9. S. Jegelka. Submodular Functions and Machine Learning. Invited lectures at the Machine Learning Summer School (MLSS), Cádiz, May 2016.

10. S. Jegelka. Submodular Functions and Machine Learning. Invited short course at the University of Heidelberg, Germany, Jan 2016.

11. S. Jegelka. Submodularity in Machine Learning. Invited lectures at the Machine Learning Summer School (MLSS), Kyoto, Aug 2015.

12. S. Jegelka. Submodular Optimization and Machine Learning. Invited lectures at the Microsoft Research Summer School on Machine Learning, Bangalore, June 2015.

13. S. Jegelka, L. Ladicky, S. Ramalingam, C. Russell. Energy Minimization and Discrete Optimization. Full day tutorial at the IEEE International Conference on Computer Vision (CVPR), Boston, June 2015.

14. S. Jegelka. Efficiently Handling Discrete Structure in Machine Learning. Invited lectures at the MADALGO summer school, Aarhus, Aug 2014.

15. A. Krause and S. Jegelka. Submodularity in Machine Learning: New Directions. Tutorial at the International Conference on Machine Learning, Atlanta, June 2013.

16. S. Jegelka and A. Krause. Submodularity in Machine Learning and Computer Vision. Tutorial at the DAGM-OAGM Symposium, Graz, Aug 2012.

17. A. Krause and S. Jegelka. Submodularity in Artificial Intelligence. Invited Tutorial at the European Conference on Artificial Intelligence (ECAI), Montpellier, Aug 2012.

Invited Talks

18. Dutch optimization seminar, virtual, Oct 2023.

19. Distinguished Plenary Speaker, *Modeling and Optimization: Theory and Applications (MOPTA)* conference, Lehigh University, Aug 2023.

20. Keynote, *Graph Exploitation workshop*, MIT Endicott House, Aug 2023.

21. IAIFI summer workshop (AI Institute for Artificial Intelligence and Fundamental Interactions), Northeastern University, Aug 2023.

22. ICERM workshop *Mathematical and Scientific Machine Learning*, Institute for Computational and Experimental Research in Mathematics, Brown University, June 2023.

23. CSAIL *Imagination in Action*, MIT, June 2023

24. ICERM workshop *Optimal Transport in Data Science*, Institute for Computational and Experimental Research in Mathematics, Brown University, May 2023

25. ICERM workshop *Trends in Computational Discrete Optimization*, Institute for Computational and Experimental Research in Mathematics, Brown University, Apr 2023

26. *Statistical Machine Learning* workshop, Columbia University, Apr 2023

27. Workshop on *Artificial Intelligence and Discrete Optimization*, Institute for Pure & Applied Mathematics (IPAM), March 2023

28. Harvard University Center of Mathematical Sciences and Applications (CMSA) *Conference on Geometry and Statistics*, Feb 2023

29. AI4OPT seminar, Georgia Institute of Technology, Feb 2023

30. NeurIPS tutorial panelist, tutorial on Bayesian Optimization, Dec 2022

31. NeurIPS workshop *Self-supervised learning: Theory and practice*, Dec 2022

32. Princeton Optimization seminar, Dec 2022

33. **Distinguished speaker seminar**, University of Chicago, Oct 2022

34. Learning Theory Alliance Mentoring workshop, Oct 2022.

35. Simons workhop *New Directions in Theoretical Machine Learning*, Schloss Elmau, Germany, Sep 2022

36. **Semi-plenary speaker**, International Symposium on Mathematical Programming, 2022

37. **Invited Sectional Lecture**, International Congress of Mathematicians (ICM), July 2022.

38. TTIC workshop: *Representation Learning Theory*. TTIC, Aug 22

39. Keynote speaker, CSIRO Machine Learning and Artificial Intelligence Future Science Platform (MLAI FSP) conference (MARS), Sydney/virtual, May 2022.

40. ICLR workshop on Grounded ML, April 2022

41. ICLR workshop on Geometric and Topological Representation Learning, April 2022

42. ORC seminar, Operations Research Center, MIT, March 2022

43. IEEE SP Data Science Initiative webinar Data Science on Graphs, March 2022

44. AAAI workshop on ML4OR, March 2022

45. AAAI workshop on Graphs and more Complex structures for Learning and Reasoning (GCLR), April 2022

46. NeurIPS workshop on Self-supervised Learning, Dec 2021

47. Google workshop on Scalable Algorithms for Semi-Supervised and Unsupervised Learning, Oct 2021

48. Conference on Mathematics in Machine Learning, Center for Interdisciplinary Research, Bielefeld University, Bielefeld, Germany (virtual), Aug 2021.

49. FODSI workshop on Machine Learning for Algorithms (ML4ALG) (virtual), Foundations of Data Science Institute, July 2021.

50. Topical Seminar, Technical University Dortmund, Germany (virtual), July 2021.

51. **Plenary Speaker**, annual meeting of the Canadian Applied and Industrial Mathematics Society (virtual), June 2021.

52. Workshop on The Multifaceted Complexity of Machine Learning, Institute for Mathematical and Statistical Innovation (IMSI) (virtual), University of Chicago, April 2021

53. Women in Theoretical Machine Learning Symposium (WTMLS) (virtual), TTIC, April 2021

54. Theory of Machine Learning seminar (virtual), Harvard University, April 2021

55. Applied Mathematics Seminar, Yale University, March 2021

56. IPAM workshop on Deep Learning and Combinatorial Optimization (virtual), Institute for Pure and Applied Mathematics, UCLA, Feb 2021

57. MINDS TRIPODS workshop on Graph and Deep Learning (virtual), Johns Hopkins University, Jan 2021

58. Flatiron Institute, Mathematics of Deep Learning seminar (virtual), Nov 2020

59. Two Sigma (virtual), Nov 2020

60. University of Texas at Austin, ML seminar series (virtual), Nov 2020

61. DeepMath workshop (virtual), Nov 2020

62. Conference *Machine Learning in Science*, University of Tuebingen (virtual), July 2020

63. ICML workshop on Negative Dependence and Submodularity: Theory and Applications in Machine Learning (virtual), July 2020

64. Mathematical Institute for Data Science (MINDS) (virtual), Johns Hopkins University, April 2020

65. Math and Data (MAD) seminar, Center for Data Science and Courant Institute, New York University, Feb 2020

66. Machine Learning Advances and Applications Seminar, Vector and Fields Instiutes, University of Toronto, Feb 2020

67. NeurIPS workshop on Optimal Transport in Machine Learning (OTML), Vancouver, Dec 2019

68. NeurIPS workshop on Sets and Partitions, Vancouver, Dec 2019

69. MIT Sports Summit, Nov 2019

70. Workshop on Theory of Deep Learning: Where next? IAS, Princeton, Oct 2019

71. Microsoft Research **Distinguished AI Lecture**, Redmond, Oct 2019

72. Google ML Theory workshop, NYC, Sep 2019

73. IBM Watson AI Week, Foundations of Safe Learning workshop, Cambridge, Sep 2019

74. **Keynote Talk**, Conference on Uncertainty in Artificial Intelligence (UAI), Tel Aviv, July 2019

75. SIAM Conference on Applied Algebraic Geometry, Session on Positive and Negative Dependence, Bern, July 2019

76. ETH Zurich, Dept of Computer Science, July 2019

77. University of Pennsylvania Warren Center, Theory Seminar, Apr 2019

78. Women in Data Science Conference (WiDS), Cambridge, March 2019

79. MIFODS workshop on Non-convex Optimization and Deep Learning, MIT, Jan 2019

80. Probability and Statistics Seminar, Boston University, Nov 2018

81. Computational Research in Boston and Beyond (CRIBB) seminar, MIT, Nov 2018

82. International Conference on Complex Systems (ICCS), Cambridge, July 2018

83. SIAM Discrete Mathematics Conference, Minisymposium on *Foundations of Data Science*, Denver, June 2018

84. NIPS workshop *Bayesian Optimization for Science and Engineering (BayesOpt)*, Los Angeles, Dec 2017

85. CISE seminar, Center for Information and Systems Engineering, Boston University, Oct 2017

86. Berkeley Information Systems Seminar, UC Berkeley, Oct 2017

87. Neyman seminar, Dept. of Statistics, UC Berkeley, Sep 2017

88. Georgia Tech ARC Colloquium, Algorithms and Randomness Center, Sep 2017

89. MSR Colloquium, MSR New England, Aug 2017

90. University College London, Gatsby Unit, May 2017

91. Machine Learning Diversity Event, Department of Statistics, Oxford University, May 2017

92. Workshop on *Optimization and Statistical Learning*, Les Houches, April 2017

93. Models, Inference & Algorithms Seminar, Broad Institute, Cambridge, Mar 2017

94. NIPS workshop on *Nonconvex Optimization*, Barcelona, Dec 2016

95. New England Machine Learning Day, Microsoft Research New England, May 2016

96. Image and Video Computing Seminar, Boston University, Apr 2016

97. ORC seminar, Operations Research Center, MIT, March 2016

98. Applied Statistics seminar, Harvard University, March 2016

99. Pattern Theory Seminar, Dept. of Applied Mathematics, Brown University, Feb 2016

100. Center for Scientific Computing, University of Heidelberg, Germany, Jan 2016

101. CMStatistics, London, Dec 2015

102. WNCG seminar, University of Texas at Austin, Nov 2015

103. Award lecture, German Conference on Pattern Recognition, RWTH Aachen University, Oct 2015

104. Strata + Hadoop World, Hardcore Data Science Track, New York, Sept 2015

105. Workshop on *Data-driven Algorithmics*, Harvard University, Sept 2015

106. IMA workshop on *Convexity and Optimization: Theory and Applications*. Institute for Mathematics and its Applications, Univ. of Minnesota, Feb 2015

107. Simons Institute for the Theory of Computing, UC Berkeley, Nov 2014

108. Cornell University, Dept. of Computer Science, May 2014

109. University of California San Diego, Dept. of Computer Science (CSE), April 2014

110. MIT, Dept. of EECS, April 2014

111. Princeton University, Dept. of Computer Science, April 2014

112. Cornell University, Dept. of Operations Research and Information Engineering, March 2014

113. Harvard University, Dept. of Computer Science (SEAS), March 2014

114. Microsoft Research, Cambridge, UK, March 2014

115. California Institute of Technology, Dept. of Electrical Engineering, March 2014

116. University College London, Gatsby Unit, March 2014

117. Saarland University, Saarbrücken, Germany, March 2014

118. University of British Columbia, Dept. of Computer Science, Vancouver, Feb 2014

119. Algebraic Statistics Seminar, UC Berkeley, Feb 2014

120. The University of Tokyo, Optimization Seminar, Dept. of Mathematical Informatics, Jan 2014

121. Carnegie Mellon University, Dept. of Statistics, Pittsburgh, Nov 2013

122. Washington University St. Louis, Dept. of Computer Science, Oct 2013

123. Carnegie Mellon University, Dept. of Machine Learning, Pittsburgh, Sep 2013

124. EPFL, School of Computer and Communication Sciences (IC), Lausanne, April 2013

125. UC Davis, seminar on Algebra and Discrete Mathematics, Feb 2013

126. INRIA, SIERRA team, Paris, Dec 2012

127. International Symposium on Mathematical Programming (ISMP), Session on "Methods from Discrete Mathematics in Systems Biology", Berlin, 2012

128. Mitsubishi Electric Research Lab (MERL), Boston, March 2012

129. Technical University Munich, Dept. of Mathematics, Oct 2011

130. UC Berkeley, Dept. of EECS, Sept 2011

131. Cornell University, Dept. of Computer Science, Ithaca, Sept. 2011

132. Toyota Technological Institute (TTI) Chicago, Aug 2011

133. Microsoft Research Redmond, Computer Vision Group, July 2011

134. ETH Zurich, Dept. of Computer Science, April 2011

135. COSA workshop: Combinatorial Optimization, Statistics and Applications, Technical University Munich, March 2011

136. Symposium on Computer Vision and Machine Learning, Institute of Science and Technology Austria, Oct 2010

TEACHING

At MIT:

6.3730/6.3732, IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Navid Azizan, Suvrit Sra), Spring 2023

6.S898 Deep Learning, Lecturer
Dept. of EECS, MIT (with Phillip Isola), Fall 2022

MIT Professional Education: Machine Learning and Big Data, Lecturer
with Regina Barzilay, Suvrit Sra, June 2022

Great Learning: Applied Datascience Bootcamp, Lecturer
(with Devavrat Shah, Munther Dahleh, Caroline Uhler, John Tsitsiklis)
Lectures on Deep Learning and Computer Vision, repeatedly, 2022 and 2023

6.036 Introduction to Machine Learning, Lecturer
Dept. of EECS, MIT, with Leslie Kaelbling, Ashia Wilson, Iddo Drori, Jehangir Amjad, Yoon Kim, Tomas Lozano Pérez, Wojciech Matusik, Spring 2022

6.419/439, IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Caroline Uhler), Fall 2021

Great Learning: Applied Datascience Bootcamp, Lecturer
(with Devavrat Shah, Munther Dahleh, Caroline Uhler, John Tsitsiklis)
Lectures on Deep Learning and Computer Vision, July 2021

MIT Professional Education: Ethics of AI, Lecturer
with Bernhardt Trout, June 2021

MIT Professional Education: Machine Learning and Big Data, Lecturer
with Tommi Jaakkola, Regina Barzilay, June 2021

6.419/439, IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Caroline Uhler), Spring 2021

Great Learning: Applied Datascience Bootcamp, Lecturer
(with Devavrat Shah, Munther Dahleh, Caroline Uhler, John Tsitsiklis
Lectures on Deep Learning and Computer Vision, Dec 2020

MIT Professional Education: Ethics of AI, Lecturer
with Bernhardt Trout, Sep 2020

MIT Professional Education: Machine Learning and Big Data, Lecturer
with Tommi Jaakkola, Regina Barzilay, June 2020

6.862 Applied Machine Learning, Lecturer
Dept. of EECS, MIT, Spring 2020

6.419/439, IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Munther Dahleh), Fall 2019

MIT Professional Education: Ethics of AI, Lecturer
with Bernhardt Trout, Oct 2019

MIT Professional Education: Machine Learning and Big Data, Lecturer
with Tommi Jaakkola, Regina Barzilay, June and Nov 2019

6.862 Applied Machine Learning, Lecturer
Dept. of EECS, MIT, Spring 2019

MIT Management Executive Education: Machine Learning in Business, online course, Lecturer
MIT Sloan School of Management and CSAIL (course organizer: Thomas Malone), running in 2020

6.419/439, IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Caroline Uhler), Fall 2018

6.419/439, IDS.012/131 Statistics, Computation and Applications, Lecturer

Dept. of EECS and Institute for Data, Systems and Society, MIT (with Caroline Uhler), Fall 2017

MIT Professional Education: Machine Learning and Big Data, Lecturer
with Tommi Jaakkola, Regina Barzilay, June 2017

6.862 Applied Machine Learning, Lecturer
Dept. of EECS, MIT, Spring 2017

IDS.012/131 Statistics, Computation and Applications, Lecturer
Dept. of EECS and Institute for Data, Systems and Society, MIT (with Caroline Uhler), Fall 2016

MITx Professional Education: Data Science: Data to Insights, Lecturer
Institute for Data, Systems and Society, MIT (course organizers: Devavrat Shah, Philippe Rigollet), Summer/Fall 2016 (and recurring every semester)

6.046/18.410 Design and Analysis of Algorithms, Lecturer
Dept. of EECS, MIT (with Constantinos Daskalakis, Vinod Vaikuntanathan), Spring 2016

6.883 Advanced Machine Learning: Learning with Combinatorial Structure, Lecturer
Dept. of EECS, MIT, Fall 2015

6.437 Inference and Information, Lecturer
Dept. of EECS, MIT (with Gregory Wornell), Spring 2015

Other Teaching:

Discrete Mathematics and Logic, Teaching Assistant; Dept. of Mathematics, University of Tübingen, Spring 2003

Advanced C++, Grader; Dept. of Computer Science, University of Tübingen, Fall 2002

Guest lectures
6.034 Artificial Intelligence, MIT, Nov 2015

EE 227A Convex Optimization, UC Berkeley, Feb 2013

STUDENTS SUPERVISED

Postdocs
Nikolaos Karalias, since Aug 2023
Luana Rubini Ruiz, Jan 2023-Aug 2023 *next position: Assistant Professor, Johns Hopkins University*
Nisha Chandramoorthy (with Youssef Marzouk), July 2021-Dec 2022, *next position: Assistant Professor, Georgia Institute of Technology*
Alkis Gkotovos, Aug 2019-Dec 2021
Marwa El Halabi, Oct 2018-Oct 2020, *next position: Mila/Samsung SAIT AI Lab*
Hongzhou Lin, Jan 2018-June 2020; *next position: Amazon*

Graduate students (current)
Cameron Diao, MIT EECS, since 2023
Sobhan Mohammadpour, MIT EECS, since 2023
Sharut Gupta, MIT EECS, since 2022
Derek Lim, MIT EECS, since 2021
Behrooz Tahmasebi, MIT EECS, since 2019
Khashayar Gatmiry, MIT EECS, since 2019
Thien Le, MIT EECS, since 2019
Michael Murphy, MIT Computational and Systems Biology PhD Program (co-advised with Ernest Fraenkel), since 2018

Graduate students (past)
Ching-Yao Chuang, MIT EECS, (co-advised with Antonio Torralba), Ph.D. 2023, *next position: Meta AI*
Joshua Robinson, MIT EECS, (co-advised with Suvrit Sra), Ph.D. 2023, *next position: postdoc at Stan-*

ford University
Yuchen Chai, MIT EECS and Dept of Urban Studies and Planning (co-advised with Siqi Zheng), Master, 2023.
Olivia Peihua Pfeiffer MIT Technology Policy Program, M.S. (co-advised with Elsa Olivetti)
Keyulu Xu, MIT EECS, Ph.D. 2021; received **MIT Sprowls Thesis Award**, *next position: Two Sigma*
Matthew J. Staib, MIT EECS, Ph.D. 2020; *next position: Two Sigma*
Chengtao Li, MIT EECS, (co-advised with Suvrit Sra), Ph.D. 2019; *Galixir, founder*
Zi Wang, MIT EECS, (Master, co-advised with Leslie Kaelbling and Tomas Lozano-Pérez); *next position: Google*

Robert Nishihara, UC Berkeley, (with Michael I. Jordan), Spring 2014
Evan Shelhamer, UC Berkeley, (with Trevor Darrell), Spring 2013–Fall 2013
Hyun Oh Song, UC Berkeley, (with Trevor Darrell), Fall 2012–Fall 2013, *now Assistant Professor at Seoul National University*

Charlotte Bunne, Master's student from ETH, Summer/Fall 2018, received **ETH medal** for Master's thesis completed in my group
Ilija Bogunovic, visiting student from EPFL, Fall 2017, *now Lecturer (Assistant Prof) at University College London*
Alkis Gkotovos, visiting student from ETH, Summer 2016
Josip Djolonga, visiting student from ETH, Summer 2015

Undergraduate students
Kritkorn Karntikoon, MIT SuperUROP, Fall 2017-Spring 2018, *now PhD student at Princeton*
Andreea Bobu, MIT SuperUROP, Fall 2016-Spring 2017 (with Polina Golland), *now PhD student at UC Berkeley*
Yi (Tony) Zeng, MIT UROP, Spring 2017 (with Elsa Olivetti), *now at Lyft*
Victoria Gong, MIT SuperUROP, Fall 2015-Spring 2016 (with Elsa Olivetti)
Thanard Kurutach, MIT UROP, Summer 2015, *now PhD student at UC Berkeley*
Wei Hu, MIT UROP, visiting undergraduate student from Tsinghua University, Spring 2015, *now PhD student at Princeton*

Ph.D. Thesis committee member
David Alvarez Melis, MIT EECS
Ilija Bogunovic, Dept. of EE, EPFL
Aleksandar Bojchevski, Dept of CS, Technical University (TU) Munich
Zhengdao Chen, Dept of Mathematics, NYU
Sebastian Claici, MIT EECS
Theresa Cloutier, MIT Chemical Engineering
Jennifer Drexler, MIT EECS
Jonathan Frankle, MIT EECS
Andreea Gane, MIT EECS
Vikas Garg, MIT EECS
Aude Genevay, Dept of Mathematics, Université Paris Dauphine and Ecole Normale Supériéure
Alkis Gkotovos, Dept of CS, ETH Zurich
Maxwell Philip Gold, MIT Bioengineering
Paul Grigas, MIT ORC
Jonathan Frankle, MIT EECS
Chinmay Kulkarni, MIT Mechanical Eng.
Guang-He Lee, MIT EECS
Renjie Liao, Dept of CS, University of Toronto
Hongzhou Lin, INRIA
Sepideh Mahabadi, MIT EECS
Paresh Malalur, MIT EECS
Zelda Lawson Mariet, MIT EECS
Tin Danh Nguyen, MIT EECS

Felix Opolka, Cambridge University
Adityanarayanan Radhakrishnan, MIT EECS
David Reshef, MIT EECS
Alvin Shi, MIT Computational and Systems Biology PhD Program (CSB)
Miriam Shiffman, MIT Computational and Systems Biology PhD Program (CSB)
Gal Shulkind, MIT EECS
Will Stephenson, MIT EECS
Berk Ustun, MIT EECS
Fulton Wang, MIT EECS
Shenhao Wang, MIT Urban Studies and Planning
Tong Wang, MIT EECS
Tongzhou Wang, MIT EECS
Young Gyu Yoon, MIT EECS
Chiyuan Zhang, MIT EECS
Yan Zhao, MIT EECS

PROFESSIONAL SERVICE

Workshop/Session/Seminar Organization

- NeurIPS workshop "Heavy Tails in ML: Structure, Stability, Dynamics", Dec 2023
  with Umut Şimşekli, Mert Gürbüzbalaban, Michael Mahoney

- Boston Symmetry Day, MIT, Nov 2023
  with Hannah Lawrence, Derek Lim, John Park, Robin Walters

- Boston Symmetry Day, Northeastern University, Apr 2023
  with Hannah Lawrence, Derek Lim, John Park, Robin Walters

- NeurIPS workshop "New Frontiers in Graph Learning", Dec 2022
  with Jiaxuan You, Marinka Zitnik, Rex Ying, Yizhou Sun, Hanjun Dai

- Dagstuhl seminar "Graph Embeddings: Theory meets Practice", March 2022
  with Christopher Morris, Stephan Günnemann, Martin Grohe

- IPAM workshop on "Deep Learning and Combinatorial Optimization", Feb 2021
  with Peter Battaglia, Xavier Bresson, Yann LeCun, Andrea Lodi, Stanley Osher, Oriol Vinyals, Max Welling

- ICML workshop on "Graph Representation Learning and Beyond", July 2020
  with Michael Bronstein, Andreea Deac, William L. Hamilton, Jessica B. Hamrick, Milad Hashemi, Jure Leskovec, Renjie Liao, Federico Monti, Yizhou Sun, Kevin Swersky, Petar Veličković, Rex Ying, Marinka Žitnick

- Workshop "Women in Data Science (WiDS)", Cambridge, February 2017, March 2018, March 2019, March 2020, March 2021, March 2022, March 2023, March 2024

- MIT Institute for Foundations of Data Science, workshop "Learning under complex structure", Jan 2020
  with Philippe Rigollet, Constantinos Daskalakis, Jonathan Kelner, Ankur Moitra

- NeurIPS workshop on "Graph Representation Learning", Vancouver, Dec 2019
  with Rianne van den Berg, Michael Bronstein, William L. Hamilton, Thomas Kipf, Jure Leskovec, Renjie Liao, Yizhou Sun, Petar Velicković

- MIT Institute for Foundations of Data Science, workshop "Non-convex optimization and deep learning", Jan 2020
  with Aleksander Madry, Joan Bruna, Constantinos Daskalakis, Ankur Moitra, Alexander Rakhlin, Shai Shalev-Shwartz, Yaron Singer, Harrison Zhou

- DIMACS workshop on "Optimization and Machine Learning", Lehigh University, Aug 2018
  with Katya Scheinberg, Martin Takac, Courtney Paquette, Edo Liberty, Frank E. Curtis, Satyen Kale, Francesco Orabona
- NIPS workshop on "Discrete Structure in Machine Learning", Los Angeles, Dec 2017
  with Yaron Singer, Amin Karbasi, Jeff Bilmes, Andreas Krause
- NIPS workshop on "Nonconvex Optimization", Barcelona, Dec 2016
  with Percy Liang, Anima Anandkumar, Hossein Mobahi, Anna Choromanska
- Workshop on "Learning and Optimization", Data Learning and Inference meeting (DALI), Sestri Levante, April 2016
  with Guillaume Obozinski
- Invited session on "Submodularity in Machine Learning – Theory and Practice"
  International Symposium on Mathematical Programming, Pittsburg, July 2015
- New England Machine Learning Day (NEML), Cambridge, May 2015
  with Carla Brodley, Finale Doshi-Velez, Adam Kalai
- NIPS Workshop "Discrete Optimization in Machine Learning (DISCML)", Montréal, Dec 2014
  with Jeff Bilmes, Andreas Krause
- NIPS Workshop "Discrete Optimization in Machine Learning (DISCML)", Vancouver/Granada/Lake Tahoe, Dec 2010-2013
  with Jeff Bilmes, Andreas Krause, Pradeep Ravikumar
- Short Course on Theoretical Neuroscience; for the College of Neuroscience, German National Academic Foundation (Studienstiftung), Tübingen, 2006
  with Philipp Berens
- MIT Machine Learning Colloquium, organizer, since 2016

(Senior) Area Chair / Senior Program Committee
- International Conference on Machine Learning (ICML) 2023 (SAC)
- Conference on Uncertainty in Artificial Intelligence (UAI) 2020
- International Conference on Machine Learning (ICML) 2020
- Conference on Neural Information Processing Systems (NIPS/NeurIPS) 2019
- International Conference on Machine Learning (ICML) 2019
- Conference on Neural Information Processing Systems (NIPS/NeurIPS) 2018
- Conference on Neural Information Processing Systems (NIPS/NeurIPS) 2017
- International Conference on Machine Learning (ICML) 2017
- Conference on Neural Information Processing Systems (NIPS/NeurIPS) 2016
- International Conference on Machine Learning (ICML) 2016
- Conference on Artificial Intelligence and Statistics (AISTATS) 2016
- Conference on Uncertainty in Artificial Intelligence (UAI) 2015

Other Chairing / Committees
- Advisory Board, Learning on Graphs conference, since 2022
- **Program Chair**, International Conference on Machine Learning (ICML), 2022
- Communications Chair, International Conference on Machine Learning (ICML), 2021
- Advisory Board, Learning Theory Alliance, since 2020
- Faculty Mentor, Rising Stars workshop, 2020

- Workshop Chair, Conference on Neural Information Processing Systems (NeurIPS), 2020
- Press Chair, International Conference on Machine Learning (ICML), 2020
- Test of Time Award Committee, International Conference on Machine Learning (ICML), 2020
- Member of the Open Graph Benchmark steering committee, since 2019
- Workshop proposal reviewer, ICML 2019
- Steering Committee, DIMACS/Simons Collaboration on *Bridging Continuous and Discrete Optimization*, 2018–2020
  special focus program as a follow-up to the Simons Institute Program with the same title
- Awards Committee, International Conference on Machine Learning (ICML), 2017
- Proceedings Chair, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2016

- MIT Climate and Sustainability Consortium, Faculty Steering Committee, since 2021
- Advisory Board for Societal and Ethical Responsibilities of Computing, MIT Schwarzman College of Computing, since 2019

Editorial Board
- Action Editor, *Journal of Machine Learning Research*, since 2019

Reviewing
- Journal of Machine Learning Research
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- Mathematical Programming
- SIAM Journal on Computing
- International Conference on Machine Learning (ICML) 2009, 2012, 2013, 2015
- Conference on Uncertainty in Artificial Intelligence (UAI) 2012
- Annual Conference on Neural Information Processing Systems (NIPS) 2009, 2010, 2014
- AAAI Conference on Artificial Intelligence (AAAI) 2010
- Annual Conference on Learning Theory (COLT) 2010, 2013, 2015, 2016
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) 2009, 2010
- NIPS Workshop on Discrete Optimization in Machine Learning 2010-2014
- ACM-SIAM Symposium on Discrete Algorithms (SODA) 2015
- IEEE Annual Symposium on Foundations of Computer Science (FOCS) 2016