Hanie Sedghi

Senior Research Scientist
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Current Interest

I co-lead a team that works on enhancing foundational models' planning and reasoning capabilities to solve difficult science, engineering and real-world problems.

Professional Career

2017–present	**Senior Research Scientist**, Google DeepMind. Lead: DeepPhenomena team
2016–2017	**Research Scientist**, Allen Institute for Artificial intelligence (AI2).
2014–2016	**Research Scholar**, Computer Science Department, University of California, Irvine.
2010–2015	**Ph.D. in Computer Science**, University of Southern California. Minor in Mathematics Thesis: Stochastic Optimization in High Dimensions.
2007–2009	**M.S. in Electrical Engineering**, Sharif University of Technology. First rank in class of 2009.
2003–2007	**B.S. in Electrical Engineering**, Sharif University of Technology.

Academic Service

Program Chair: CoLLAs 2023

Workshop co-Chair: NeurIPS 2023

Tutorial co-Chair: ICML 2022, ICML 2023

Editorial Board: JMLR (2020-)

Area Chair: ICML (2019-), NeurIPS (2021-), ICLR (2021-), ALT(2021), MLSys(2019-20).

Reviewer: NeurIPS (2013-), ICML (2013-), ICLR (2017-), JMLR (2018-), COLT (2016-), AISTATS(2016-20), AAAI(2016-19).

Workshop Organizer:

- Mathematical and Empirical Understanding of Foundation Models (ME-FoMo), ICLR 2023
- DeepPhenomena 2021 workshop, Google 2021
- Overparametrization: Pitfalls and Opportunities workshop, ICML 2021
- Deep learning (Mis)understandings, Google 2021
- Deep Learning day, KDD 2020
- Deep Phenomena workshop, ICML 2019

Publications

1. *Can Neural Network Memorization be Localized?*
   P. Maini, M. Mozer, **H. Sedghi**, Z. Lipton, Z. Kolter, C. Zhang, **ICML 2023**.
2. *Leveraging Unlabeled Data to Track Memorization*,
   M. Forouzesh, **H. Sedghi**, P. Thiran, **ICLR 2023**.
3. *REPAIR: REnormalizing Permuted Activations for Interpolation Repair*,
   K. Jordan **H. Sedghi**, O. Saukh, R. Entezari, B. Neyshabur, **ICLR 2023**.
4. *The Role of Pre-training Data in Transfer Learning*,
   R. Entezari, M. Wortsman, O. Saukh, MM. Shariatnia, **H. Sedghi**, L. Schmidt, arXiv pre-print, 2023.
5. *Layer-stack Temperature Scaling*,
   A. Khalifa, M. Mozer, **H. Sedghi**, B. Neyshabur, I. Alabdulmohsint, arXiv pre-print, 2022.
6. *Exploring the limits of large scale pretraining*,
   S. Abnar, M. Dehghani, B. Neyshabur, **H. Sedghi**, Spotlight, **Spotlight, ICLR 2022**.
7. *Leveraging Unlabeled Data to Predict Out-of-Distribution Performance*,
   S. Garg, S.Balakrishnan, Z. Lipton, B. Neyshabur, **H. Sedghi**, **ICLR 2022**.
8. *The role of permutation invariance in linear mode connectivity of neural networks*,
   R. Entezari, **H. Sedghi**, O. Saukh, B. Neyshabur, **ICLR 2022**.
9. *Avoiding Spurious Correlations: Bridging Theory and Practice,*,
   T. Nguyen, V. Nagarajan **H. Sedghi**, B. Neyshabur, **NeurIPS 2021** DistShift workshop.
10. *Gradual Domain Adaptation in the Wild: When Intermediate Distributions are Absent*,
    S. Abnar, R. van den Berg, G. Ghiasi, M. Dehghani, N. Kalchbrenner, **H. Sedghi**, arXiv pre-print, 2021.
11. *Understanding the effect of sparsity on neural networks robustness*,
    L. Timpl, R. Entezari, **H. Sedghi**, B. Neyshabur, O. Saukh, **ICML 2021** workshop on Overparametrization: Pitfalls and Opportunities.
12. *The Deep Bootstrap: Good Online Learners are Good Offline Generalizers*,
    P. Nakkiran, B. Neyshabur, **H. Sedghi**, **ICLR 2021**.
13. *Regularizing the training of convolutional neural networks*
    V. Gupta and P. Long, **H. Sedghi**, **US Patent App. 16/422,797**.

14. *What is being transferred in transfer learning?*,
B. Neyshabur*, **H. Sedghi***, C. Zhang*, **NeurIPS 2020**.

15. *The intriguing role of module criticality in the generalization of deep networks*,
N. Chatterji, B. Neyshabur, **H. Sedghi**, **Spotlight, ICLR 2020**.

16. *Generalization bounds for convolutional neural networks*,
P. Long* and **H. Sedghi***, **ICLR 2020**.

17. *On the effect of the activation function on the distribution of hidden nodes in a deep network*,
P. Long* and **H. Sedghi***, **Neural Computation Journal**. **July. 2019**

18. *The Singular Values of Convolutional Layers*
H. Sedghi, V. Gupta and P. Long, **ICLR 2019**.

19. *MLSys: The new frontiers of machine learning systems*, Alexander Ratner, Dan Alistarh, Gustavo Alonso, David G Andersen, and 65 other authors including **H. Sedghi***, 2019.

20. *How Good Are My Predictions? Efficiently Approximating Precision-Recall Curves for Massive Datasets*
A. Sabharwal* and **H. Sedghi***, **plenary presentation at Uncertainty in Artificial Intelligence (UAI) 2017**. **Patent**.

21. *Knowledge Completion for Generics using Guided Tensor Factorization*
H. Sedghi and A. Sabharwal, accepted in **Transactions of the Association for Computational Linguistics (TACL) 2017**.

22. *Training Input-Output Recurrent Neural Networks through Spectral Methods*
H. Sedghi and A. Anandkumar, **June 2017**.

23. *Provable Tensor Methods for Learning Mixtures of Generalized Linear Models*
H. Sedghi, Majid Janzamin and A. Anandkumar, accepted in **Artificial Intelligence and Statistics (AISTATS) 2016**.

24. *FEAST at Play: Feature ExtrAction using Score function Tensors*
M. Janzamin*, **H. Sedghi***, U.N. Niranjan* and A. Anandkumar, **Journal of Machine Learning Research**, vol 44, pp 130-144, **2015**.

25. *Beating the Perils of Non-Convexity: Guaranteed Training of Neural Networks using Tensor Methods*
M. Janzamin, **H. Sedghi** and A. Anandkumar, **2015**.

26. *Learning Mixed Membership Community Models in Social Tagging Networks through Tensor Methods*
A. Anandkumar and **H. Sedghi**, **April 2015**.

27. *Score Function Features for Discriminative Learning*
M. Janzamin*, **H. Sedghi*** and A. Anandkumar, **International Conference on Learning Representations (ICLR)**, San Diego, 2015

28. *Provable Methods for Training Neural Networks with Sparse Connectivity*
H. Sedghi and A. Anandkumar, **International Conference on Learning Representations (ICLR)**, San Diego, 2015.

29. *Score Function Features for Discriminative Learning: Matrix and Tensor Framework*
M. Janzamin*, **H. Sedghi*** and A. Anandkumar, **Dec. 2014**.

30. *Multi-Step Stochastic ADMM in High Dimensions: Applications in Sparse Optimization and Noisy Matrix Decomposition*
H. Sedghi, A. Anandkumar and E. Jonckheere. **Neural Information Processing Systems (NIPS)**, Montreal, 2014.

31. *Provable Methods for Training Neural Networks with Sparse Connectivity*
H. Sedghi and A. Anandkumar, **NIPS Workshop on Deep Learning**, Montreal, 2014.

32. *Statistical Structure Learning to Ensure Data Integrity in Smart Grid*
H. Sedghi and E. Jonckheere, **IEEE Transactions on Smart Grid**, Vol. 6, issue 4.

33. *Statistical Structure Learning of Smart Grid for Detection of False Data Injection*
H. Sedghi and E. Jonckheere, **IEEE Power and Energy Society General Meeting**. Vancouver, 2013.

34. *On Conditional Mutual Information in Gaussian-Markov Structured Grids*
H. Sedghi and E. Jonckheere, **Information and Control in Networks**, G. Como, B. Bernhardson, and A. Rantzer, Springer.

35. *A Misbehavior-Tolerant Multipath Routing Protocol for Wireless Ad hoc Networks*
H. Sedghi, M.R. Pakravan and M. R. Aref, **International Journal of Wireless Information Networks**, 2011.

36. *A Game-Theoretic Approach for Power Allocation in Bidirectional Cooperative Communication*
M.Janzamin, M. R. Pakravan, **H. Sedghi**, **IEEE Wireless Communication and Networking Conference**, Sydney, 2010.