

Or Sharir

California Institute of Technology
Department of Computing + Mathematical Sciences
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EDUCATION **Hebrew University of Jerusalem, Israel** 2014-2021
Ph.D. (direct track) in Computer Science
Advisor: Prof. Amnon Shashua

Hebrew University of Jerusalem, Israel 2009-2013
B.Sc. in Physics, Mathematics, and Computer Science

RESEARCH **Postdoctoral Scholar, California Institute of Technology** 2021-Present
EXPERIENCE **Department of Computing + Mathematical Sciences**
Advisors: Prof. Anima Anandkumar and Prof. Garnet Chan

PUBLICATIONS

1. **O. Sharir**, A. Shashua, G. Carleo, "Neural tensor contractions and the expressive power of deep neural quantum states", Machine Learning and the Physical Sciences Workshop at Neural Information Processing Systems (ML4Science @ NeurIPS), 2021.
2. Y. Levine, N. Wies, **O. Sharir**, H. Bata, A. Shashua, "Limits to Depth Efficiencies of Self-Attention", Advances in Neural Information Processing Systems (NeurIPS), 2020.
3. Y. Levine, B. Lenz, O. Dagan, D. Padnos, **O. Sharir**, S. Shalev-Shwartz, A. Shashua, Y. Shoham, "SenseBERT: Driving Some Sense into BERT", Annual Meeting of the Association for Computational Linguistics (ACL), 2020.
4. **O. Sharir**, Y. Levine, N. Wies, G. Carleo, A. Shashua, "Deep Autoregressive Models for the Efficient Variational Simulation of Many-body Quantum Systems", *Physical Review Letters (PRL)*, 2020 (Impact Factor = 9.227)
5. Y. Levine, **O. Sharir**, N. Cohen, A. Shashua, "Quantum Entanglement in Deep Learning Architectures", *Physical Review Letters (PRL)*, 2019 (Impact Factor = 9.227)
6. Y. Levine, **O. Sharir**, A. Shashua, "Benefits of Depth for Long-Term Memory of Recurrent Networks", *International Conference on Learning Representations (ICLR), Workshop Track*, 2018
7. **O. Sharir**, A. Shashua, "On the Expressive Power of Overlapping Architectures of Deep Learning", *International Conference on Learning Representations (ICLR)*, 2018 (Acceptance rate = 36.0%)
8. **O. Sharir**, A. Shashua, "Sum-Product-Quotient Networks", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018 (Acceptance rate = 33.2%)
9. N. Cohen, **O. Sharir**, A. Shashua, "On the Expressive Power of Deep Learning: A Tensor Analysis", *Conference on Learning Theory (COLT)*, 2016 (Acceptance rate = 31.7%)
10. N. Cohen, **O. Sharir**, A. Shashua, "Deep SimNets", *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016 (Acceptance rate = 29.9%)

PREPRINTS

1. Y. Levine, **O. Sharir**, A. Ziv, A. Shashua, "On the Long-Term Memory of Deep Recurrent Networks", *arXiv:1710.09431v2*, 2018
2. N. Cohen, **O. Sharir**, Y. Levine, R. Tamari, D. Yakira, A. Shashua, "Analysis and Design of Convolutional Networks via Hierarchical Tensor Decompositions", *arXiv:1705.02302*, 2017

3. **O. Sharir**, R. Tamari, N. Cohen, and A. Shashua, "Tensorial Mixture Models", *arXiv:1610.04167*, 2016

WHITE PAPERS

1. O. Lieber, **O. Sharir**, B. Lenz, Y. Shoham, "Jurassic-1: Technical details and evaluation", AI21 Labs, 2021.
2. Y. Zeldes, D. Padnos, **O. Sharir**, B. Peleg, "Technical Report: Auxiliary Tuning and its Application to Conditional Text Generation", AI21 Labs, 2020.
3. **O. Sharir**, B. Peleg, Y. Shoham, "The Cost of Training NLP Models: A Concise Overview", AI21 Labs, 2020.

INVITED TALKS

1. "Autoregressive Simulation of Many-body Quantum Systems", Haifa ML Meetup, Feb 2020.
2. "Autoregressive Simulation of Many-body Quantum Systems", Deep Learning for Physics Seminar Series, Princeton Center for Theoretical Science, Oct 2019.
3. "Autoregressive Simulation of Many-body Quantum Systems", (spotlight talk) workshop on "Theory of Deep Learning: Where next?", Institute for Advanced Studies, Oct 2019.
4. "Autoregressive Simulation of Many-body Quantum Systems", Machine Learning Seminar, New York University, October 2019.
5. "Autoregressive Simulation of Many-body Quantum Systems", DOLCIT Seminar Series at California Institute of Technology, September 2019.
6. "Autoregressive Simulation of Many-body Quantum Systems", workshop on "AI and Tensor Factorization for Physical, Chemical, and Biological Systems", September 2019.
7. "On the Suitability of Neural Networks for the Simulation of Quantum Many-body Systems", 16th International Conference on Approximation Theory, May 2019.
8. "Deep autoregressive models for the efficient variational simulation of many-body quantum systems", special Quantum Information seminar, Technion - Israel Institute of Technology, April 2019.
9. "Deep autoregressive models for the efficient variational simulation of many-body quantum systems", Machine Learning seminar, Technion - Israel Institute of Technology, March 2019.
10. "On the Expressive Power of ConvNets and RNNs as a Function of their Architecture", PixelClub seminar series, Technion - Israel Institute of Technology, January 2019.
11. "On the Expressive Power of ConvNets and RNNs as a Function of their Architecture", Machine Learning seminar series, Bar Ilan University, May 2018.
12. "On the Expressive Power of Overlapping Architectures of Deep Learning", Haifa ML Meetup, March 2018.
13. "On the Expressive Power of Overlapping Architectures of Deep Learning", Deep Learning Summer School Contributed Talk, June 2017.
14. "Expressive Efficiency and Inductive Bias of Convolutional Networks", Machine Learning Israel Seminar Meetup, May 2017.
15. "The Expressive Efficiency of the Architectural Attributes of Convolutional Networks", Theory Lunch at Princeton, Apr 2017.

REVIEWER

ICLR	2019,2021
AISTATS	2021
Journal of Approximation Theory	2017-2018,2021
NeurIPS (Best Reviewer 2019 - top 8.5%)	2018-2020
ICML	2019
JMLR	2018-2019
UAI	2018

COLT 2018
CVPR'17 Tensor Methods in Computer Vision Workshop 2017

TEACHING EXPERIENCE
Undergraduate Engineering Senior Projects: Advisor on ML projects. 2016-2020
Image Processing Course: TA in charge of homework assignments. 2015-2019
Advanced Seminar in Deep Learning: Organizer. 2016-2018
Computer Vision Course: Grader. 2015-2016
Algorithms Course: Grader. 2014-2014

INDUSTRY EXPERIENCE
AI21 Labs (<https://ai21.com>): Research Scientist 2019-2021

Three Tall Guys (<https://threetallguys.com>): Co-founder and CTO 2013-2014
We created *Here-a-Story*, an iPhone app for sharing audio stories about places.

Freelance iOS Developer 2009-2016

Select projects:

- **MySongbook:** An iOS app for viewing and managing chord sheets for songs. Developed and sold by myself with nearly 50,000 sales.
- **HomeStyler:** An iOS and Android augmented reality app for interior design. Contract work for Autodesk. Developed the core augmented reality experience of placing furniture into rooms photographed by the user. Built a simple 3D engine with pure OpenGL, combined with input from the accelerometer to orient the objects.