Zoe Piran

Curriculum Vitae

zoe.piran@gmail.com zoepiran.com

Academic appointment

Dec. 2024–present **Postdoctoral Fellow**
Genentech Research & Early Development, Aviv Regev.
Stanford University, Jure Leskovec.

Bridging artificial intelligence and experimental biology.
Developing AI systems for scientific discovery, grounded in live-cell imaging, connecting visual reasoning with experimental knowledge and practice.

Education

Oct. 2020–Dec. 2024 **Ph.D., Computer Science**
The Hebrew University of Jerusalem. Supervisor: Mor Nitzan.
Doctoral dissertation awarded distinction.

2018–2020 **M.Sc., Physics**
The Hebrew University of Jerusalem. Supervisors: Naftali Tishby and Zohar Ringel.
Magna cum laude; average: 95.8.

2015–2018 **B.Sc., Physics and Computer Science** (double major)
The Hebrew University of Jerusalem. *Magna cum laude*; average: 94.

Earlier research experience

2020–2024 **Doctoral research**, The Hebrew University of Jerusalem
School of Computer Science and Engineering; Mor Nitzan.
Encoding and decoding cellular identities in single-cell data.
Uncovering structure in complex biological systems using ideas and methods from computer science and physics.

May–Sep. 2023 **Research Intern**, Apple ML Research, Paris
Host: Marco Cuturi.
Self-supervised learning using the Multi-Marginal Matching Gap.
Combining self-supervised learning with multi-marginal optimal transport.

2018–2020 **Master's research**, The Hebrew University of Jerusalem
Racah Institute of Physics; Naftali Tishby and Zohar Ringel.
The Dual Information Bottleneck.
Developing an information-theoretic method connecting statistical mechanics and deep learning.

Oct. 2019 **Visiting Scholar**, Harvard University
NSF–Simons Center for Quantitative Biology.

2014–2017 **Research with Nir Friedman**, The Hebrew University of Jerusalem
School of Computer Science and Engineering and Alexander Silberman Institute of Life Sciences. Computational analysis of multi-modal datasets.

PUBLICATIONS

* Equal contribution.

1. M. Schaefer, **Z. Piran**, N. P. Walter, A. Awasthi, C. Bock, J. Leskovec & Z. Good, "Transitive Representation Learning Enhances Histopathology Annotation." *Proceedings of the 43rd International Conference on Machine Learning*, PMLR 306:108093–108114 (2026). [paper]
2. R. Viñas Torné, M. Wiatrak, **Z. Piran**, S. Fan, L. Jiang, S. A. Teichmann, M. Nitzan & M. Brbić, "Systema: a framework for evaluating genetic perturbation response prediction beyond systematic variation". *Nature Biotechnology* 44(6), 1050–1059 (2026). doi:10.1038/s41587-025-02777-8
3. S. Dubnov, **Z. Piran**, A. Alper, A. Yefroimsky, H. Soreq & M. Nitzan, "Identifying maximally informative signal-aware representations of single-cell data using the information bottleneck." *Cell Systems* 17(5), 101571 (2026). doi:10.1016/j.cels.2026.101571
4. J. Karin*, **Z. Piran*** & M. Nitzan, "Enhancing swarms' durability to threats via graph signal processing and graph-neural-network-based generative modeling." *Physical Review E* 112(6), 065305 (2025). doi:10.1103/f495-8ddd
5. M. Ricci, G. Pelc, **Z. Piran**, N. Moriel, & M. Nitzan, "TRENDy: Temporal Regression of Effective Nonlinear Dynamics." *The Thirteenth International Conference on Learning Representations* (2025). [paper]
6. D. Klein*, G. Palla*, M. Lange*, M. Klein*, **Z. Piran***, M. Gander, L. Meng-Papaxanthos, M. Sterr, L. Saber, C. Jing, A. Bastidas-Ponce, P. Cota, M. Tarquis-Medina, S. Parikh, I. Gold, H. Lickert, M. Bakhti, M. Nitzan, M. Cuturi & F. J. Theis, "Mapping cells through time and space with moscot." *Nature* 638(8052), 1065–1075 (2025). doi:10.1038/s41586-024-08453-2
7. M. Lange*, **Z. Piran***, M. Klein*, B. Spanjaard*, D. Klein, J. P. Junker, F. J. Theis, & M. Nitzan, "Mapping lineage-traced cells across time points with moslin." *Genome Biology* 25, 277 (2024). doi:10.1186/s13059-024-03422-4
8. **Z. Piran**, N. Cohen, Y. Hoshen & M. Nitzan, "Disentanglement of single-cell data with biolord." *Nature Biotechnology* 42(11), 1678–1683 (2024). doi:10.1038/s41587-023-02079-x
9. **Z. Piran***, M. Klein*, J. Thornton, & M. Cuturi, "Contrasting Multiple Representations with the Multi-Marginal Matching Gap." *Proceedings of the 41st International Conference on Machine Learning*, PMLR 235:40827–40842 (2024). [paper]
10. **Z. Piran** & M. Nitzan, "SiFT: uncovering hidden biological processes by probabilistic filtering of single-cell data." *Nature Communications* 15, 760 (2024). doi:10.1038/s41467-024-44757-7
11. M. Ricci, N. Moriel, **Z. Piran** & M. Nitzan, "Phase2vec: Dynamical systems embedding with a physics-informed convolutional network." *The Eleventh International Conference on Learning Representations* (2023). [paper]
12. **Z. Piran** & T. Piran, "The Origin of Binary Black Hole Mergers." *The Astrophysical Journal* 892(1), 64 (2020). doi:10.3847/1538-4357/ab792a
13. **Z. Piran**, R. Shwartz-Ziv, & N. Tishby, "The Dual Information Bottleneck". *preprint arXiv:2006.04641* (2020). doi:10.48550/arXiv.2006.04641

Conference and symposium presentations

Talks

Nov. 2026	Tracing by visual reasoning. AITHYRA 1-Day Symposium: *The Next Generation: AI for Biomedical Science*, Vienna, Austria. Invited speaker. *[program]*
Feb. 2026	Exposing spatiotemporal dynamics within the cellular continuum. 11th ILANIT/FISEB Conference, Eilat, Israel. Oral presentation. *[program]*
Jul. 2024	International Conference on Machine Learning (ICML). Oral presentation. *[program]*
Dec. 2023	Optimal Transport and Machine Learning workshop, NeurIPS. Contributed talk. *[program]*
Mar. 2023	Physics of Life. Spotlight talk. *[program]*
Jun. 2022	Single Cell Biology. Spotlight talk. *[program]*

Poster presentations

Sep. 2026	Single Cell Genomics, Dunblane, Scotland. Poster presentation.
Sep. 2025	Single Cell Genomics, Djuronaset, Stockholm, Sweden. Poster presentation.
Mar. 2025	AI Revolution Meets 4D Cellular Physiology, Janelia Research Campus. Poster presentation.
Sep. 2024	Single Cell Genomics 2024. Poster presentation.
Jan. 2023	5th Advanced School in Computer Science and Engineering: AI for Better Medicine. Poster presentation.

Seminars and research presentations

Dec. 2025	Department of Life Sciences, Ben-Gurion University, Be'er Sheva, Israel.
Jul. 2024	Stanford AI+Biomedicine Seminar, Stanford University, California, USA.
May 2024	Arjun Raj Lab, University of Pennsylvania, Philadelphia, USA.
May 2024	Center for Computational Biology, Flatiron Institute, Simons Foundation, New York, USA.
May 2024	Nir Yosef Lab, Weizmann Institute of Science, Rehovot, Israel.
Mar. 2024	Journal Club, Judith Zaugg Lab. Virtual.
Feb. 2024	Immunai, Tel Aviv, Israel.
Dec. 2023	Compugen, Holon, Israel.
Jul. 2023	scverse Community Meeting. Virtual.
Apr. 2023	Lander Lab Group Meeting, Broad Institute of MIT and Harvard, Cambridge, USA.
Feb. 2023	Shalev Itzkovitz Lab Group Meeting, Weizmann Institute of Science, Rehovot, Israel.
Nov. 2022	Super Group Meeting, Hubrecht Institute, Utrecht, Netherlands.
Oct. 2019	QBio Group Meeting, NSF–Simons Center for Quantitative Biology, Harvard University, Cambridge, USA.

AWARDS AND SCHOLARSHIPS

2025	Certificate of Distinction for the doctoral dissertation, The Hebrew University of Jerusalem.
2022–2024	Clore Scholarship for Ph.D. Students, The Clore Israel Foundation.
2021–2024	Scholarship for Outstanding Doctoral Students in Data Science, Council for Higher Education.
2018–2024	Scholarship for Master's Degrees for Outstanding Women in Hi-Tech, Council for Higher Education.
2017–2018	Computer Science Honors Program for Undergraduates, The Hebrew University of Jerusalem.
2016–2018	Dean's Honors List, The Hebrew University of Jerusalem.

TEACHING, SERVICE AND OUTREACH

2026	Co-organizer, AIDaR: AI Data Readiness for Scientific Discovery, Workshop at NeurIPS 2026, Paris, France. *[website]*
2024–present	Co-organizer, Stanford AI+Biomedicine Seminar.
2020–2024	Co-leader, Physics & Computer Science Undergraduate Program, The Hebrew University of Jerusalem.
2018–2024	Teaching Assistant, The Hebrew University of Jerusalem. Courses: Computation and Physics Lab; Mechanics for Bio-Medicine Students; General Physics—Mechanics for Chemistry & Earth Students.
2018–2024	Management of media channels, Racah Institute of Physics, The Hebrew University of Jerusalem.

ADDITIONAL INFORMATION

Citizenship	U.S, Swiss, Israeli