

Michael M. DANZIGER

PLACE AND DATE OF BIRTH: Los Angeles, California | November 26, 1986
CITIZENSHIP: USA + Israel
HOME ADDRESS: 63 Leamington Rd, Unit 2, Brighton, MA 02135, USA
ACADEMIC AFFILIATION: Network Science Institute, Northeastern University, Boston, MA 02115, USA
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WORK EXPERIENCE

- 2017 - | Post-doctoral researcher at **NORTHEASTERN UNIVERSITY**
Post-doc in the Barabasi Lab at the Network Science Institute of Northeastern University.
Leading resilience sub-group within lab. Co-teaching “Network Science” course Fall 2019.
- 2016 - 2017 | Short-term Consultant at **WORLD BANK**
For flagship report on network connectivity and economic development under Dr. David Michael Gould, Chief Economist, Europe and Central Asia Region
- 2013 - 2017 | Teaching Assistant at **BAR ILAN UNIVERSITY**
Frontal review for Physics for Medical Students, International Program
- 2012 - 2013 | Lecturer at **JERUSALEM COLLEGE OF TECHNOLOGY**
Linear Algebra II for Engineers, International School
- 2012 | Full Stack Developer at **QUIZREVOLUTION**
Development of all new features, maintenance, technical support and web design. Front-end Javascript, Back-end PHP, MySQL
- 2011 - 2012 | Teaching Assistant at **JERUSALEM COLLEGE OF TECHNOLOGY**
Frontal reviews for Precalculus, Calculus and Linear Algebra for the International School.
- 2008 - 2009 | Teaching Assistant at the **HEBREW UNIVERSITY**.
Grading exercises for Linear Algebra for Physicists

EDUCATION

- 2018 | Ph.D. in **PHYSICS**, **Bar Ilan University**, Ramat Gan, Israel
Thesis: “Beyond Interdependent Networks:
Structures, interactions and processes in networks of networks”
Advisor: Prof. Shlomo HAVLIN
- 2012 | M.Sc. in **THEORETICAL PHYSICS**, **Hebrew University**, Jerusalem, Israel
Thesis: “Microstructure and Global-Local Coupling as Indicators for Economic Development:
A Reevaluation and Improvement of the Product Space”
Advisor: Prof. Sorin SOLOMON
- 2008 | B.Sc. in **APPLIED PHYSICS** specializing in **MEDICAL ENGINEERING**
Jerusalem College of Technology, Jerusalem, Israel
Thesis: “Protein Folding based on the Miyazawa-Jernigan Model: An Evaluation”
Advisor: Prof. Uziel SANDLER
- 2003 | Arts and math courses at **Santa Monica College**, Santa Monica, CA

SCHOLARSHIPS AND PRIZES

- 2017 Best Oral Presentation, NetSciX, Tel Aviv, Israel, January 15-18, 2017.
2015 - 2017 Azrieli fellowship.
Full tuition, plus stipend and research budget for up to three years.
One of ten Ph.D. students in all fields in Israel to win in 2015.
2013 - 2015 President's scholarship for excellent doctoral students at Bar-Ilan University.
2006 - 2008 Scholarship for honors program at Jerusalem College of Technology.
One of eight students in the 1500+ student body selected to participate in a research program.
Eight hours a week of research work with tuition scholarship. Under Prof. Yaakov Friedman.

PROGRAMMING LANGUAGES AND FRAMEWORKS

Ability to analyze and present complex arguments.

- Python: 10 years experience.
Fluent with numpy/scipy/matplotlib, pandas, sklearn. Experienced with keras and tensorflow.
C/C++: 7 years experience.
High-performance simulation, procedural and object-oriented, terminal and GUI programming.
CUDA: 3 years experience.
Wrote kernels for GPU-accelerated simulation of dynamical systems on networks.
PHP: 2 years experience.
Wrote and maintained several websites, including database access and templating.
SQL: 2 years experience.
Maintained db for web app. Organized simulation results to serve figures online.
Linux: 15 years experience configuring and maintaining LINUX desktops and servers,
including on AWS and Google Cloud.
Other: Experienced with: \LaTeX , Inkscape, GIMP, Git, Mercurial, R, Mathematica and Matlab.

LANGUAGES

- ENGLISH: Native language
HEBREW: Full fluency
JAPANESE: Limited working proficiency speaking, reading and writing

ONLINE EDUCATION (COURSERA)

Certificates available for all courses.

- 2019 Deep Learning Specialization (Prof. Andrew Ng, deeplearning.ai):
"Neural Networks and Deep Learning," "Structuring Machine Learning Projects,"
"Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization,"
"Convolutional Neural Networks," "Sequence Models"
"Bayesian Statistics: From Concept to Data Analysis," Prof. Herbert Lee
2014 "Introduction to Systems Biology," Prof. Ravi Iyengar, (with distinction)
"R Programming," Dr. Roger Peng, (with distinction)
"Programming Mobile Applications for Android Handheld Systems," Prof. Adam Porter
2013 "Machine Learning," Prof. Andrew Ng

PUBLICATIONS

- M.M. Danziger, B. Gross, S.V. Buldyrev.
"Faster calculation of the percolation correlation length on spatial networks,"
Phys. Rev. E Phys. Rev. E **101**, 013306 (2020) doi:[10.1103/PhysRevE.101.013306](https://doi.org/10.1103/PhysRevE.101.013306)
- I. Bonamassa, B. Gross, M.M. Danziger, S. Havlin.
"Critical Stretching of Mean-Field Regimes in Spatial Networks,"
Phys. Rev. Lett. **123**, 088301 (2019) doi:[10.1103/PhysRevLett.123.088301](https://doi.org/10.1103/PhysRevLett.123.088301)
- M.M. Danziger, I. Bonamassa, S. Boccaletti, S. Havlin.
"Dynamic interdependence and competition in multilayer networks,"
Nature Physics, **15**, 178 (2019) doi:[10.1038/s41567-018-0343-1](https://doi.org/10.1038/s41567-018-0343-1)
- L.M. Shekhtman, M.M. Danziger, D. Vaknin, S. Havlin.
"Robustness of spatial networks and networks of networks,"

5. L.M. Shekhtman, M.M. Danziger, I. Bonamassa, S.V. Buldyrev, G. Caldarelli, V. Zlatic, S. Havlin. "Critical field-exponents for secure message-passing in modular networks," *New J. Physics* **20**, 053001 (2018) doi:[10.1088/1367-2630/aabe5f](https://doi.org/10.1088/1367-2630/aabe5f)
6. L.M. Shekhtman, M.M. Danziger, S. Havlin. "Spreading of Failures in Interdependent Networks," Chapter 20 in *Diffusive Spreading in Nature, Technology and Society*, Bunde A., Caro J., Kärger J., Vogl G. (eds) . Springer, Cham (2018) doi:[10.1007/978-3-319-67798-9_20](https://doi.org/10.1007/978-3-319-67798-9_20)
7. S.M. Krause, M.M. Danziger and V. Zlatic. "Color-avoiding percolation," *Physical Review E* **96**, 022313 (2017) doi:[10.1103/PhysRevE.96.022313](https://doi.org/10.1103/PhysRevE.96.022313)
8. D. Vaknin, M.M. Danziger, S. Havlin. "Spreading of localized attacks in spatial multiplex networks," *New J. Physics* **19**, 073037 (2017) doi:[10.1088/1367-2630/aa7b09](https://doi.org/10.1088/1367-2630/aa7b09)
9. B. Gross, D. Vaknin, M.M. Danziger and S. Havlin. "Multi-universality and localized attacks in spatially embedded networks," *JPS Conf. Proc.* **16**, 011002 (2017) doi:[10.7566/JPSCP.16.011002](https://doi.org/10.7566/JPSCP.16.011002)
10. S.M. Krause, M.M. Danziger and V. Zlatic. "Hidden connectivity in networks with vulnerable classes of nodes," *Physical Review X* **6**, 041022 (2016) doi:[10.1103/PhysRevX.6.041022](https://doi.org/10.1103/PhysRevX.6.041022)
11. M.M. Danziger, L.M. Shekhtman, Y. Berezin and S. Havlin. "The effect of spatiality on multiplex networks," *EPL (Europhysics Letters)* **115**, 36002 (2016) doi:[10.1209/0295-5075/115/36002](https://doi.org/10.1209/0295-5075/115/36002)
12. M.M. Danziger, O.I. Moskalenko, S.A. Kurkin, X. Zhang, S. Havlin and S. Boccaletti. "Explosive synchronization coexists with continuous synchronization in the Kuramoto model," *Chaos (AIP)* **26**, 065307 (2016) doi:[10.1063/1.4953345](https://doi.org/10.1063/1.4953345)
13. L.M. Shekhtman, M.M. Danziger and S. Havlin. "Recent advances on failure and recovery in networks of networks," *Chaos, Solitons & Fractals* **90**, 28 (2016) doi:[10.1016/j.chaos.2016.02.002](https://doi.org/10.1016/j.chaos.2016.02.002)
14. M.M. Danziger, L.M. Shekhtman, A. Bashan, Y. Berezin and S. Havlin. "Vulnerability of interdependent networks and networks of networks," Chapter 5 in *Interconnected Networks, Springer, Understanding Complex Systems*, 79 (2016) doi:[10.1007/978-3-319-23947-7_5](https://doi.org/10.1007/978-3-319-23947-7_5)
15. I. Sendiña-Nadal, M.M. Danziger, Z. Wang, S. Havlin and S. Boccaletti. "Assortativity and leadership emerge from anti-preferential attachment in heterogeneous networks," *Scientific Reports* **6**, 21297 (2016) doi:[10.1038/srep21297](https://doi.org/10.1038/srep21297)
16. M.M. Danziger, A. Bashan and S. Havlin. "Interdependent resistor networks with process-based dependency," *New J. Physics* **17**, 043046 (2015) doi:[10.1088/1367-2630/17/4/043046](https://doi.org/10.1088/1367-2630/17/4/043046)
17. Y. Berezin, A. Bashan, M.M. Danziger, D. Li and S. Havlin. "Localized attacks on spatially embedded networks with dependencies," *Scientific Reports* **5**, 8934 (2015) doi:[10.1038/srep08934](https://doi.org/10.1038/srep08934)
18. M.M. Danziger, A. Bashan, Y. Berezin and S. Havlin. "Percolation and cascade dynamics of spatial networks with partial dependency," *J. Complex Networks* **2**, 460 (2014) doi:[10.1093/comnet/cnu020](https://doi.org/10.1093/comnet/cnu020)
19. M.M. Danziger, A. Bashan, Y. Berezin, L.M. Shekhtman and S. Havlin. "An Introduction to Interdependent Networks," *NDES 2014 Proceedings, Comm. Comp. & Inf. Science* **438**, 189 (2014) doi:[10.1007/978-3-319-08672-9_24](https://doi.org/10.1007/978-3-319-08672-9_24)
20. L.M. Shekhtman, Y. Berezin, M.M. Danziger and Shlomo Havlin. "Robustness of a network formed of spatially embedded networks," *Phys. Rev. E* **90**, 012809 (2014) doi:[10.1103/PhysRevE.90.012809](https://doi.org/10.1103/PhysRevE.90.012809)
21. M.M. Danziger, A. Bashan, Y. Berezin and S. Havlin. "Interdependent Spatially Embedded Networks: Dynamics at Percolation Threshold," *SITIS 2013 Proceedings* 619 (2013) doi:[10.1109/SITIS.2013.101](https://doi.org/10.1109/SITIS.2013.101)

22. Y. Friedman and M.M. Danziger.

“The Complex Faraday Tensor for Relativistic Evolution of a Charged Particle in a Constant Field,”
PIERS Proceedings 5, 531-535 (2008) doi:[10.2529/PIERS071219094923](https://doi.org/10.2529/PIERS071219094923)

CONFERENCE PRESENTATIONS

All talks contributed unless otherwise noted. Full details available at <http://www.mmdanziger.com>

- 2020 NetSciX2020
- 2019 NetSci2019, SIAM DS19 (dynamical systems) (invited)
APS March Meeting 2019
- 2018 Multinets 2018 (satellite of NetSci2018) (invited), SIAM DS19 (dynamical systems) (invited)
APS March Meeting 2018 (invited)
- 2017 CompleNet'17, NetSciX2017
- 2016 Multilevel Complex Systems (satellite of CCS2016), APEC-SSS 2016,
National Institute of Informatics of Japan (seminar), RIEB seminar of Kobe University (seminar)
NetONets 2016 (satellite of NetSci2016) (invited)
Third Conf. on Cognition Research, Israeli Society for Cognitive Psychology (*invited*)
- 2015 Physics of multilayered interconnected networks (satellite of NetSci2015) (*invited*)
ETOPIM 10, CompleNet 2015, Colloquium at Yeshiva University (seminar)
- 2013 Second International Workshop on Complex Networks and their Applications
National Institute of Informatics of Japan (seminar), NetONets 2013 (satellite of NetSci2013)
- 2008 PIERS Cambridge 2008

OTHER ACADEMIC ACTIVITIES

- Journals: Reviewer for Nature Communications, Nature Human Behavior, Chaos, PLoS One, Nature Scientific Reports.
- Conferences: Program committee member for CompleNet2018, NetSciX2020, CompleNet2020.
- Grants: Wrote successful grant applications for Israel Science Foundation, Office of Naval Research (USA), Defense Threat Reduction Agency (USA), Ministry of Foreign Affairs (Israel).
Defended research in person to funders at European Commission and Office of Naval Research.