

Curriculum Vitae



Prof. Yaneer Bar-Yam received his SB and PhD in physics from MIT in 1978 and 1984 respectively. Since the late 1980s he has contributed to founding the field of complex systems science, introducing fundamental mathematical rigor, real world application, and educational programs for new concepts and insights of this field. In developing new mathematical methods and in their application he has published on a wide range of scientific and real world problems ranging from cell biology to the global financial crisis.

He worked on the Ebola outbreaks in West Africa and in the DRC on policy advice to the US government through the NSC, the UN, and WHO Global Outbreak Alert and Response Network (GOARN) as well as working with community efforts in Liberia that were instrumental in stopping the outbreak at far less than 1% of cases predicted by epidemiological simulations. In 2020-1 he founded endcoronavirus.org, the Covid Action Group, and the World Health Network and engaged in policy and community efforts globally including Australia, Ireland, Israel, Netherlands, Argentina, Lithuania, Costa Rica, and the US.

He has also advised the Chairman's Action Group at the Pentagon about global social unrest and the crises in Egypt and Syria, the National Security Council and the National Counter Terrorism Council on global strategy, the Chief of Naval Operations Strategic Studies Group about military force transformation, the Centers for Disease Control and Prevention about delivery of prevention services and control of hospital infections, Chairman of the House Financial Services Committee, Congressman Barney Frank about market regulation and the financial crisis, and other government organizations, NGOs, and corporations on using principles and insights from complex systems science.

His development of multiscale representations as a

Yaneer Bar-Yam

Founding President

New England Complex Systems Institute

generalization of renormalization group addressed the limitations of calculus and statistics in the study of nonlinear and network system dependencies in collective behaviors. His recent work quantitatively analyzes the origins and impacts of market crashes, social unrest, ethnic violence, military conflict and pandemics, the structure and dynamics of social networks, as well as the bases of creativity, panic, evolution and altruism. He is the author of over 200 research papers in professional journals, including *Science*, *Nature*, *PNAS*, *American Naturalist*, and *Physical Review Letters*, has 4 patents, and has given 175 invited presentations. His work on the causes of the global food crisis was cited among the top 10 scientific discoveries of 2011 by *Wired* magazine.

He is the author of two books: a textbook *Dynamics of Complex Systems*, and *Making Things Work*, which applies complex systems science to solving problems in healthcare, education, systems engineering, international development, and ethnic conflict. He has taught the concepts and methods of complex systems science to over 2,000 graduate students, professionals and executives. He has been a Visiting Scholar at Department of Molecular and Cellular Biology at Harvard and the Federal Reserve Bank of Boston, and Research Scientist at the MIT Media Laboratory.

He chaired the International Conference on Complex Systems (ICCS) and is the managing editor of a Springer book series on complexity. His work has been described in *The New York Times*, *The Wall Street Journal*, *The Washington Post*, *The Guardian*, *The Sunday Times*, *Die Zeit*, *Le Monde*, *Time*, *The Atlantic Monthly*, *Scientific American*, *Wired*, *Fast Company*, *Forbes*, *Slate*, *Mother Jones*, and *Vice*, among others. He has appeared on ABC News, Canada's CTV, RT, BBC Radio, NPR Radio, and other national media outlets. His scientific visualizations received recognition as "best of" from *Wired* in 2011 and 2013, and from *Motherboard* in 2013.

Born: August 29, 1959 - Boston, Mass. U.S.A.

Citizenship: U.S.A.

Education:

S.B. Physics, M.I.T. (August 1978)

Ph.D. Physics, M.I.T. (August 1984)

Positions:

President, NECSI (1997-present)

Associate Professor, Boston University (1991-1997)

Senior Scientist, Weizmann Institute of Science (1988-1991)

Postdoctoral Fellow, IBM and MIT (1986-1987)

Postdoctoral Fellow, MIT (1984-1986)

Research Assistant, MIT (1980-1984)

Visiting Positions:

Visiting Scientist, MIT Media Laboratory (2014-2019)

Federal Reserve Bank of Boston, Visiting Scholar, Research Department (2010–2011)

Harvard University, Department of Molecular and Cellular Biology (1998-2004)

MIT Physics Department (Spring 1996)

MIT Laboratory of Computer Science (1990-91)

Cornell University Physics Dept.(Spring 1989)

MIT Physics Dept. (1987-1989)

Non-appointment advisory roles:

Civilian Corona Cabinet, Israel (2020)

Congressman Joe Kennedy III (2017-2019)

National Counterterrorism Council (2015-2018)

White House National Security Council (2013-2016)

Chairman of the Joint Chiefs Action Group (2012-2013)

Chief of Naval Operations Strategic Studies Group (2000-2017)

Congressman Barney Frank, Chairman of the Financial Services Committee (2007-2011)

Congressman Michael Capuano, Financial crisis roundtable (2009)

Office of Strategy and Innovation at the Centers for Disease Control and Prevention (2005-2008)

Honors:

Member Phi Beta Kappa Honor Society (1978)

N.S.F. Fellowship (1979-1983)

Bantrell Post-Doctoral Fellowship (1984-1986)

Allon Fellowship (1988-1990)

Revson Fellowship (1988-1990)

Jefferson Cup, US Army Corp of Engineers (2010)

Commander's coins:

Director, Chief of Naval Operations Strategic Studies Group, November 2010.

Deputy Commanding General, US Army Corps of Engineers, April 2010.

Commander, North Atlantic Division, US Army Corps of Engineers, April 2010.

Commander, South Pacific Division, US Army Corps of Engineers, April 2010.

Director, Army Strategic Studies Group, January 2013.

Director, Chief of Naval Operations Strategic Studies Group, November 2013.

Commander, Special Forces Command, June 2014.

Invited, Change of Command, USASOC Headquarters, Ft. Bragg, NC, July, 2015

Selected contributions and relevant publications:

Pandemic and Pandemic response:

Engaged in research and policy advice during the 2020 Coronavirus Outbreak:

Papers <https://necsi.edu/corona-virus-pandemic>,

Founder <https://endcoronavirus.org>, covidactiongroup.net, simplecovid.org.

Member isagcovid19.org

Joseph Norman, Yaneer Bar-Yam, and Nassim Nicholas Taleb, Systemic risk of pandemic via novel pathogens – Coronavirus: A note, NECSI (January 26, 2020).

Chen Shen, Ron Mark, Nolan J. Kagetsu, Anton S. Becker, and Yaneer Bar-Yam, Combining PCR and CT testing for COVID, medRxiv (May 29, 2020).

Annelise Wilder-Smith, Yaneer Bar-Yam, and Dale Fisher, Lockdown to contain COVID-19 is a window of opportunity to prevent the second wave, International Journal of Travel Medicine, 27, 5 (May 30, 2020), taaa091, <https://doi.org/10.1093/jtm/taaa091>

Alexander F. Siegenfeld and Yaneer Bar-Yam, What models can and cannot tell us about COVID-19, NECSI PNAS July 14, 2020 117 (28) 16092-16095 (July 14, 2020), <https://doi.org/10.1073/pnas.2011542117>

Chen Shen, Qinghua Chen, and Yaneer Bar-Yam, The effect of travel restrictions on the domestic spread of the Wuhan coronavirus 2019-nCov, NECSI (February 5, 2020)

Alexander F. Siegenfeld, Chen Shen and Yaneer Bar-Yam, Comment on “Forecasting COVID-19 impact on hospital bed-days, ICU-days, ventilator-days and deaths by US state in the next 4 months,” NECSI (April 2, 2020).

Annelise Wilder-Smith, Yaneer Bar-Yam, and Dale Fisher, Lockdown to contain COVID-19 is a window of opportunity to prevent the second wave, Journal of Travel Medicine (May 30, 2020).

N.N.Taleb, Y.Bar-Yam and P. Cirillo, On single point forecasts for fat-tailed variables. International Journal of Forecasting (Oct. 20, 2020), <https://doi.org/10.1016/j.ijforecast.2020.08.008>

Alexander F. Siegenfeld and Yaneer Bar-Yam, The impact of travel and timing in eliminating COVID-19, Communications Physics (November 6, 2020). <https://doi.org/10.1038/s42005-020-00470-7>

Developed an analysis of the vulnerability to global extinction from the evolution of pathogens, with relevance to pandemics:

E. M. Rauch, Y. Bar-Yam, Long-range interactions and evolutionary stability in a predator-prey system, Physical Review E 73, 020903 (2006).

Engaged in analysis and policy for Ebola outbreaks in West Africa and DRC :

Daniel Cooney, Vincent Wong, and Yaneer Bar-Yam, Beyond contact tracing: Community-based early detection for Ebola response, PLoS Currents Outbreaks (May 19, 2016).

Yaneer Bar-Yam, Transition to extinction: Pandemics in a connected world, NECSI (July 3, 2016).

Yaneer Bar-Yam, How community response stopped Ebola, NECSI (July 11, 2016).

[This Mathematical Model from 2006 Shows How Ebola Could Wipe Us Out](#), Motherboard, September 4, 2014).

Socio-economic systems:

Analyzed the origins of social unrest due to food prices:

M. Lagi, K.Z. Bertrand, Y. Bar-Yam, [The Food Crises and Political Instability in North Africa and the Middle East](#), arXiv:1108.2455, August 10, 2011.

(See: [The Math That Predicted the Revolutions Sweeping the Globe Right Now](#), Motherboard, February 19, 2014)

Developed multiscale models predicting ethnic conflict and conditions for peace, validated in India, the former Yugoslavia and Switzerland:

- M. Lim, R. Metlzer, and Y. Bar-Yam. Global Pattern Formation and Ethnic/Cultural Violence, *Science* 317, 5844 (September 14, 2007). [abstract and full paper](#) - [press release](#)
- A. Rutherford, D. Harmon, J. Werfel, S. Bar-Yam, A.S. Gard-Murray, A. Gros, Y. Bar-Yam, [Good Fences: The Importance of Setting Boundaries for Peaceful Coexistence](#). *PLoS ONE* 9(5): e95660 doi:10.1371/journal.pone.0095660 (May 21, 2014); arXiv:1110.1409 (October 7, 2011).
- A. Gros, A.S. Gard-Murray, Y. Bar-Yam [Conflict in Yemen: From Ethnic Fighting to Food Riots](#). arXiv:1207.5778, July 24, 2012.
- Y. Bar-Yam: Global Control, Ethnic Violence and Terrorism, from [Making Things Work](#), Chapter 16. Knowledge Press, 2005.
(see news reports at <http://www.necsi.edu/research/ethnicviolence/>)

Analyzed social media for the structure and dynamics of networks and sentiment:

- A. Herdağdelen, W. Zuo, A.S. Gard-Murray, Y. Bar-Yam, [An exploration of social identity: The geography and politics of news-sharing communities in Twitter](#), *Complexity* 19, 10-20 (2013).
- D. Braha, Y. Bar-Yam, From centrality to temporary fame: dynamic centrality in complex networks, *Complexity* 12 (2006). [abstract](#), [PDF file](#), [Extended Version \(PDF\)](#), [press release](#)
- K.Z. Bertrand, M. Bialik, K. Virdee, Andreas Gros, Y. Bar-Yam, [Sentiment in New York City: A High Resolution Spatial and Temporal View](#). arXiv:1308.5010 (August 20, 2013).

Analyzed country default and the European bond crisis:

- M. Lagi, Y. Bar-Yam, [The European debt crisis: Defaults and market equilibrium](#), arXiv:1209.6369 [q-fin.GN] (2012)

Developed a mathematical model for commodity price volatility and used it to analyze the causes and consequences of the global food crisis:

- M. Lagi, Yavni Bar-Yam, K.Z. Bertrand, Yaneer Bar-Yam, [The Food Crises: A Quantitative Model of Food Prices Including Speculators and Ethanol Conversion](#). arXiv:1109.4859, September 21, 2011.
- M. Lagi, Yavni Bar-Yam, K.Z. Bertrand, Yaneer Bar-Yam, [UPDATE February 2012 — The Food Crises: Predictive validation of a quantitative model of food prices including speculators and ethanol conversion](#). arXiv:1203.1313, March 6, 2012.
- M. Lagi, Yavni Bar-Yam, Yaneer Bar-Yam, [UPDATE July 2012 — The Food Crises: The US Drought](#), July 23, 2012.

Developed a method for detecting market panic and anticipating market crashes:

- D. Harmon, M. de Aguiar, D. Chinellato, D. Braha, I. Epstein, Y. Bar-Yam, [Predicting economic market crises using measures of collective panic](#). arXiv:1102.2620v1, February 13, 2010.

Analyzed corporate networks and their role in the 2008 financial crisis:

- D. Braha, B. Stacey, and Y. Bar-Yam, [Corporate Competition: A Self-Organizing Network](#). *Social Networks*, Volume 33. Issue 3. Pages 219-230. July 2011.
- D. Harmon, B. Stacey, Yavni Bar-Yam, and Yaneer Bar-Yam, [Networks of Economic Market](#)

[Interdependence and Systemic Risk](https://arxiv.org/abs/1011.3707). [arXiv:1011.3707](https://arxiv.org/abs/1011.3707), November 16, 2010.

Y. Bar-Yam, [Market Failure: Interdependence in Action](#), October 3, 2008.

Performed an analysis of market stability and the “uptick rule” to reveal its potential role in the 2008 economic crisis:

R. C. Pozen and Y. Bar-Yam, "There's a Better Way to Prevent 'Bear Raids'" The Wall Street Journal, November 18, 2008.

D. Harmon and Y. Bar-Yam, Technical Report on the SEC Uptick Repeal Pilot, November 18, 2008.

(see also S. Vedantam, "The Computer as a Road Map to Unknowable Territory," Washington Post, Feb. 16, 2009).

Constructed multiscale analyses to characterize the functional effectiveness of military, healthcare and other organizations:

Y. Bar-Yam: Complexity of Military Conflict: Multiscale Complex Systems Analysis of Littoral Warfare, Report to the CNO Strategic Studies Group (2003).

Y. Bar-Yam, Improving the Effectiveness of Health Care and Public Health: A Multi-Scale Complex Systems Analysis, American Journal of Public Health. 96, 459-466 (2006).

Y. Bar-Yam, Making Things Work (NECSI Knowledge Press, 2005).

Biological and Ecological systems:

Developed and applied multiscale analysis of large data sets to cellular biology:

B. de Bivort, S. Huang, Y. Bar-Yam, Dynamics of cellular-level function and regulation derived from Murine expression array data, PNAS 101, 17687-92 (2004).

B. de Bivort, S. Huang, Y. Bar-Yam, Empirical multiscale networks of cellular regulation. PLoS computational biology 3,1968-78 (2007)

Y. Bar-Yam, D. Harmon, and B. de Bivort, Attractors and democratic dynamics, Science 323, 1016-7 (2009)

Developed theory of speciation validated against global biodiversity data:

M. A. M. de Aguiar, M. Baranger, E. M. Baptestini, L. Kaufman, and Y. Bar-Yam, Global Patterns of Speciation and Diversity, Nature 460, 384-387 (2009)

A. B. Martins, M. A. M. de Aguiar, and Yaneer Bar-Yam, Evolution and Stability of Ring Species. PNAS 201217034 (March 11, 2013).

Developed multiscale characterization of global biodiversity:

E. M. Rauch, Y. Bar-Yam, Estimating the total genetic diversity of a spatial field population from a sample and implications of its dependence on habitat areas, PNAS 102, 9826-9829 (July 12, 2005).

E. M. Rauch, Y. Bar-Yam, Theory predicts uneven distribution of genetic diversity within species, Nature 431, 449-452 (Sept. 23, 2004).

Engineering of complex systems:

Developed the use of evolution in systems engineering:

D. Braha, A. Minai, Y. Bar-Yam (Eds.) Complex Engineered Systems (Springer, Berlin, 2006).

Y. Bar-Yam, Engineering Complex Systems: Multiscale Analysis and Evolutionary Engineering, in Complex Engineered Systems, D. Braha, A. Minai, Y. Bar-Yam (Eds.) (Springer, Berlin, 2006).

Y. Bar-Yam, About Engineering Complex Systems: Multiscale Analysis and Evolutionary

Engineering in Engineering Self Organising Systems: Methodologies and Applications, S. Brueckner, G. Di Marzo Serugendo, A. Karageorgos, R. Nagpal Eds. (Springer-Verlag Berlin, 2005), pp.16-31.

- Y. Bar-Yam, When Systems Engineering Fails --- Toward Complex Systems Engineering in International Conference on Systems, Man & Cybernetics 2003 Vol. 2 (IEEE Press, Piscataway, NJ, 2003), pp. 2021- 2028.
- Y. Bar-Yam, Large Scale Engineering and Evolutionary Change: Useful Concepts for Implementation of FORCEnet, Report to Chief of Naval Operations Strategic Studies Group, 2002.

Analyzed the structure and dynamics of collaborative design:

- D. Braha and Y. Bar-Yam, The Structure and Dynamics of Complex Product Design, in Complex Engineered Systems, D. Braha, A. Minai, Y. Bar-Yam (Eds.) (Springer, Berlin, 2006).
- D. Braha, Y. Bar-Yam, Topology of large-scale engineering problem-solving networks, Phys. Rev. E 69, 016113-1-7 (2004).
- D. Braha, Y. Bar-Yam, Information Flow Structure in Large-Scale Product Development Organizational Networks, Smart Business Networks, Peter Vervest et al Ed. (Springer Verlag, Berlin, 2004) Chap. 8.
- M. Klein, H. Sayama, P. Faratin, Y. Bar-Yam, The Dynamics of Collaborative Design: Insights from Complex Systems and Negotiation Research, in Complex Engineered Systems, D. Braha, A. Minai, Y. Bar-Yam (Eds.) (Springer, Berlin, 2006).
- M. Klein, H. Sayama, P. Faratin, Y. Bar-Yam, Negotiation Algorithms for Collaborative Design Settings, in Complex Engineered Systems, D. Braha, A. Minai, Y. Bar-Yam (Eds.) (Springer, Berlin, 2006).
- M. Klein, H. Sayama, P. Faratin, Y. Bar-Yam, What complex systems research can teach us about collaborative design in Proceedings of the Sixth International Conference on Computer Supported Cooperative Work in Design (CSCWD-2001) 5-12 (IEEE Press 2001).

General complex systems:

Developed a wide range of quantitative approaches to the analysis and modeling of complex systems:

- Y. Bar-Yam, Dynamics of Complex Systems (Perseus Press, 1997).
- Y. Bar-Yam, Unifying Principles in Complex Systems in Converging Technology (NBIC) for Improving Human Performance, M. C. Roco and W. S. Bainbridge eds., (Kluwer, 2003).

Developed new formalism for multiscale analysis:

- Y. Bar-Yam, Multiscale Variety in Complex Systems, Complexity 9, 4, 37-45 (2004).
- Y. Bar-Yam, Multiscale complexity/entropy, Advances in Complex Systems 7, 47-63 (2004).
- R. Metzler, Y. Bar-Yam, M. Kardar, Information flow through a chaotic channel: prediction and postdiction at finite resolution, Phys. Rev. E 70, 026205 (2004).
- S. Gheorghiu-Svirschevski, Y. Bar-Yam, Multiscale analysis of information correlations in an infinite-range, ferromagnetic Ising system, Phys. Rev. E 70, 066115 (2004).
- R. Metzler, Y. Bar-Yam, Multiscale analysis of correlated Gaussians, Phys. Rev. E 71. 046114 (2005).

Performed analysis of large communication dataset to determine the dynamics of network topology:

- D. Braha, Y. Bar-Yam, From centrality to temporary fame: dynamic centrality in complex

networks, Complexity 12 (2006).

D. Braha, Y. Bar-Yam, The statistical mechanics of complex product development: empirical and analytical results, Management Science 53, 7, 1127-1145 (July, 2007).

Analyzed the sensitivity and robustness of networks to stimuli:

Y. Bar-Yam, I. R. Epstein, Response of complex networks to stimuli, PNAS 101, 4341-5 (2004).

Analyzed network structures for optimization of performance:

B. Shargel, H. Sayama, I. R. Epstein, Y. Bar-Yam, Optimization of robustness and connectivity in complex networks, Phys Rev Lett 90, 068701-1-4 (2003)

M. Lim, D. Braha, S. Wijesinghe, S. Tucker, Y. Bar-Yam, preferential detachment in broadcast signaling networks: connectivity and cost trade-off, Europhysics Letters 79, 58005 (2007).

Developed an analytic exact solution of generalized network dynamics to characterize the multiscale behavior of a wide variety of complex systems:

D. Chinellato, M. de Aguiar, I. Epstein, D. Braha, Y. Bar-Yam, Dynamical Response of Networks Under External Perturbations: Exact Results., arXiv:0705.4607v2.

M. A. M. de Aguiar, I. R. Epstein, Y. Bar-Yam, Analytically solvable model of probabilistic network dynamics, Phys Rev E 72, 067102 (2005).

Other:

Studied the role of neural network subdivision in information processing:

Y. Bar-Yam, "Neural networks with subdivision" U.S. Patent No. 5,687,286 (1997).

Described theory and method for the growth of gem quality diamonds by Chemical Vapor Deposition (method currently used to grow gem diamonds):

Y. Bar-Yam and T. D. Moustakas, Defect induced stabilization of diamond films, Nature 342, 786, 14 December 1989

Contributions to understanding of the dynamics of defects, surfaces, amorphous materials, crystal growth, superconductors and polymers.

For more contributions see publications linked from:

<http://www.necsi.edu>

Curriculum Vitae (extended)

Professional Activities:

Conference Chairman:

International Conference on Complex Systems, Nashua, New Hampshire (Sept. 21-26, 1997),
Second International Conference on Complex Systems, Nashua, NH (Oct. 25-31, 1998),
Third International Conference on Complex Systems, Nashua, NH (May 21-26, 2000)
Fourth International Conference on Complex Systems, Nashua, NH (June 9-14, 2002)
Fifth International Conference on Complex Systems, Boston, MA (May 16-21, 2004)
Sixth International Conference on Complex Systems, Boston, MA (June 25-30, 2006)
Seventh International Conference on Complex Systems, Boston, MA (Oct 28 - Nov 2, 2007)
Eighth International Conference on Complex Systems, Boston, MA (June 26 - July 1, 2011)
Ninth International Conference on Complex Systems, Cambridge, MA (July 22 - July 27, 2018)

Lecturer Santa Fe Inst. Summer School (June, 1996): Defining, Measuring and Estimating Complexity

Conference Organizer:

Lattice Effects in High- T_c Superconductors, Santa Fe, New Mexico (January 13-15, 1992) with T. Egami, J. Mustre-de Leon and A. R. Bishop,
Planning meeting for a National Initiative on Complex Systems in K-16 Education (June, 1999)

U.S. Department of Energy peer review panel: High Temperature Superconductivity and Ceramics Program. Arlington, Virginia (June 2-5, 1992)

Member: American Association for the Advancement of Science, American Physical Society, Society for Chaos Theory in Psychology and Life Sciences

Editor-in-Chief: New England Complex Systems Institute Series on Complexity (Perseus Books / Springer Verlag).

Managing Editor: InterJournal, <http://interjournal.org>

Editorial Boards:

ACM Transactions on Complex Autonomous Systems (TCAS)
Advances in Complex Systems (World Scientific)
Chaos (American Institute of Physics)

Reviewer: Science, Physical Review Letters, Physical Review E, Europhysics Letters, Bioinformatics, Ecological complexity, American Naturalist, Chaos.

COVID Pandemic Response: <https://necsi.edu/corona-virus-pandemic>, endcoronavirus.org, covidactiongroup.net, simplecovid.org, isagcovid19.org

Students supervised: Finley Shapiro, C. T. Capraro, Mark Smith, Boris Ostrovsky, Jason Redi, Reza Sadr-Lahijani, D. M. Pierre, D. Goldman, Raissa D'Souza, H. Vardhan, Gavin Crooks, Eric Rauch, Ben Shargel, Benjamin Lovegren de Bivort, Justin Werfel, Greg Wolfe, Cam Terwilinger, Mark Woolsey, Chitra Ramalingam, Seth Frey, Blake Stacey, Matt Paige-Lieberman, Matt Owen, Eric Downes, Melissa Gerber, Igor Lugo, Ed Addison, Luci Leykum, Muneichi Shibata, Mai Nguyen, Ben Allen, Kawandee Virdee, Vedant Misra, Julius Adebayo, Dominic Albino, Roozbeh Daneshvar, Vaibhav Vavilala, Casey Katriel Friedman, Alfredo Morales, Lili Wang, Niko Kesten, Vincent Wong, Chen Shen, Blake Stacey

Postdocs supervised: Mark Smith, Peyman Faratin, Hiroki Sayama, S. Gheorghiu-Svirschevski, Richard Metzler, May Lim, Keith Nesbitt, Reuven Cohen, Eleni Drinea, Justin Werfel, Carlos Gershenson, Dion Harmon, Alex Rutherford, Marco Lagi, Andreas Gros, Amac Herdagdelen, Ramon Xulvi-Brunet, Urbano França, Francisco Prieto Castrillo, Joseph Norman, Leila Hedayatifar, Derrick VanGennep, Amir Akhavan

Selected student and postdoc current positions:

Ben Allen - Assistant Professor, Mathematics Department, Emanuel College

Benjamin Lovegren de Bivort - Assistant Professor, Organismic and Evolutionary Biology, Harvard University

Gavin Crooks - Senior scientist, Lawrence Berkeley National Laboratory

Raissa D'Souza - Professor, Department of Computer Science, University of California Davis

Seth Frey - Assistant Professor University of California, Davis
 Carlos Gershenson - Research Professor (Tenured), Universidad Nacional Autónoma de México
 Andreas Gros - Data Scientist, Facebook
 Amac Herdagdelen - Data Scientist, Facebook
 May Lim - Associate Professor, National Institute of Physics, University of the Philippines Diliman
 Keith Nesbitt - Senior Lecturer in Information Technology, University of Newcastle
 Hiroki Sayama - Professor, SUNY Binghamton
 Justin Werfel - Research scientist, Wyss Institute for Biologically Inspired Engineering, Harvard University
 Amir Akhavan - Lecturer, Computer & Information Science Department, UMass Dartmouth

Grants Received:

DARPA, Office of Naval Research, Air Force Office of Scientific Research, Army Research Office, Centers for Disease Control and Prevention, CNO SSG, US Army Corp of Engineers, Canada DRDC, NIH, NSF, Common Fund for Commodities, WorldBank, Lumina Foundation, Packard Foundation.

Publications:

Books (author):

Y. Bar-Yam, "Dynamics of Complex Systems," (Perseus Press, 1997)
 Y. Bar-Yam, "Making Things Work: Solving complex problems in a complex world," (2004)

Books (editor)

Y. Bar-Yam, "Unifying Themes in Complex Systems: Proceedings of the International Conference on Complex Systems," (Perseus Press, 2000)
 Y. Bar-Yam and A. Minai, "Unifying Themes in Complex Systems II: Proceedings of the 2nd International Conference on Complex Systems," (Perseus Press, 2002)
 Y. Bar-Yam and A. Minai, "Unifying Themes in Complex Systems IIIA: Proceedings of the 3rd International Conference on Complex Systems," (Perseus Press, 2004)
 Y. Bar-Yam and A. Minai, "Unifying Themes in Complex Systems IIIB: Proceedings of the 3rd International Conference on Complex Systems," (Perseus Press, 2004)
 A. Minai, D. Braha, and Y. Bar-Yam "Unifying Themes in Complex Systems, Volume 4: Proceedings of the 4th International Conference on Complex Systems (Springer, 2008)
 A. Minai, D. Braha, and Y. Bar-Yam "Unifying Themes in Complex Systems, Volume 5: Proceedings of the 5th International Conference on Complex Systems (Springer, 2011)
 A. Minai, D. Braha, and Y. Bar-Yam "Unifying Themes in Complex Systems, Volume 6: Proceedings of the 6th International Conference on Complex Systems (Springer, 2010)
 A. Minai, D. Braha, and Y. Bar-Yam "Unifying Themes in Complex Systems, Volume 7: Proceedings of the 7th International Conference on Complex Systems (Springer, 2012)
 Alfredo J. Morales, Carlos Gershenson, Dan Braha, Ali A. Minai, Yaneer Bar-Yam, Unifying Themes in Systems Volume 9: Proceedings of the Ninth International Conference on Complex Systems, (Springer, 2018) <https://doi.org/10.1007/978-3-319-96661-8>
 D. Braha, A. Minai and Y. Bar-Yam, Complex Engineered Systems, Science meets technology, (Springer Verlag, 2006)

P. vos Fellman, Y. Bar-Yam, and A. A. Minai, Conflict and Complexity: Countering Terrorism, Insurgency, Ethnic and Regional Violence (Springer Verlag, 2014).

Y. Bar-Yam, T. Egami, J. Mustre-de Leon and A. R. Bishop, Lattice Effects in High- T_c Super-conductors" (World-Scientific, 1992)

Patents:

1) Y. Bar-Yam, Neural networks with subdivision, US Patent No. 5,687,286 (1997)

2) Y. Bar-Yam, Method and apparatus for coordinating and tracking delivery of a benefit, US Patent No. 8,296,242 (2012)

3) Yaneer Bar-Yam, Dion Harmon, Kawandeeep Virdee, Vedant Misra and Marco Lagi, Method and apparatus for dynamic information visualization, US Patent No. 8,683,389 (2014)

4) Yaneer Bar-Yam, Event detection and characterization in big data streams, US Patent No. [Application No. 14/830,425 (January 29, 2019)

Publications: PRL 14, EPL 2, Nature 5, Science 2, PNAS 7 = 30

1) Y. Bar-Yam and J. D. Joannopoulos, "Barrier to Migration of the Silicon Self-Interstitial," Phys. Rev. Lett. 52, 1129 (1984)

2) Y. Bar-Yam and J. D. Joannopoulos, "Electronic Structure and Total Energy Migration Barriers of Silicon Self-Interstitials" Phys. Rev. B. 30, 1844 (1984)

3) Y. Bar-Yam and J. D. Joannopoulos, "Silicon self-interstitial migration: Multiple paths and charge states" Phys. Rev. B. 30, 2216 (1984)

4) Y. Bar-Yam and J. D. Joannopoulos, "Intrinsic defects in silicon: Formation and migration energies" Proceedings of the 17th International Conf. on the Physics of Semiconductors, San Francisco, Aug. 1984.

5) Y. Bar-Yam and J. D. Joannopoulos, "Microscopic theory of low and high temperature dynamics of intrinsic defects in silicon," Proceedings of the 13th International Conf. on Defects in Semiconductors, Coronado, Aug. 1984. J. of Electron. Mater. 14a, 261 (1985)

6) Y. Bar-Yam and J. D. Joannopoulos, "The Entropy of Defects and Diffusion in Silicon," in Microscopic Identification of Electronic Defects in Semiconductors, edited by N. M. Johnson, S. G. Bishop, G. D. Watkins, Materials Research Society Conference Proceedings Vol. 46, 123 (1985)

7) Y. Bar-Yam, J. D. Joannopoulos and D. Adler, "Determination of the Effective Correlation Energy of Defects in Semiconductors." Phys. Rev. Lett. 55, 138(1985)

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- 51) Olha Buchel, Anton Ninkov, Danise Cathel, Yaneer Bar-Yam, Leila Hedayatifar, Strategizing COVID-19 Lockdowns Using Mobility Patterns arXiv:2012.03284 [physics.soc-ph] (Dec 6, 2020)

Other publications:

- 1) R. Pozen and Y. Bar-Yam, "There's a better way to prevent bear raids" Wall Street Journal Op Ed, Nov. 18 (2008)
- 2) Y. Bar-Yam, Multiscale Representation Phase I, Final Report to Chief of Naval Operations Strategic Studies Group (2001)
- 3) Y. Bar-Yam, Enlightened Evolutionary Engineering / Implementation of Innovation in FORCEnet, Report to Chief of Naval Operations Strategic Studies Group (May 1, 2002)
- 4) Y. Bar-Yam, Complexity of Military Conflict: Multiscale Complex Systems Analysis of Littoral Warfare, Report to Chief of Naval Operations Strategic Studies Group (2003)
- 5) Y. Bar-Yam, Multiscale Complex Systems Analysis and Evolutionary Engineering, Report to the Chief of Naval Operations Strategic Studies Group (2004)
- 6) Healthcare Costs: A road map, New England Complex Systems Institute (2010)
 - Step I: Separate Simple Care
 - Step II: Empower workgroup competition
 - Step III: Create Superdoctor Teams
 - Step IV: Accelerate Intake Routing
 - Step V: Improve Communication
 - Step VI: Create Disinfection Gateways
 - Step VII: Use E-Records for Research
 - Step VIII: Promote 'First Day' Celebrations
- 7) Marco Lagi, Yavni Bar-Yam, Karla Z. Bertrand, Yaneer Bar-Yam, Economics of Food Prices and Crises, New England Complex Systems Institute (2012)
- 8) Yaneer Bar-Yam, Global Financial and Food Crises, New England Complex Systems Institute (2013)
- 9) Matthew Hardcastle and Yaneer Bar-Yam, Do we need to age? Extending the arc of life, New England Complex Systems Institute (2015)

Medium publications: (32) <https://medium.com/@yaneerbaryam>

Research reports:

- 1) Y. Bar-Yam, "The Theoretical Microscope: Ab-initio Quantum Total Energy Calculations," NECSI Research Report YB-0002 (1991)
- 2) Y. Bar-Yam, "Sleep as a Dynamical Dissociative Self-Patterning," NECSI Report YB-0003 (1991)
- 3) Y. Bar-Yam, "Sleep as Self-Dissociation," NECSI Report YB-0004 (1991)
- 4) Y. Bar-Yam, "Sleep as Temporary Brain Dissociation," NECSI Report YB-0005 (1993)
- 5) Y. Bar-Yam, "Partial Subdivision in Attractor Neural Networks," NECSI Report YB-0006 (1993)
- 6) Y. Bar-Yam, "The emerging networked global economy," NECSI Report YB-0007 (1993)

- 7) Y. Bar-Yam, "Why (partially) subdivide the brain," NECSI Report YB-0008 (1993)
- 8) Y. Bar-Yam, "Complexity rising: From human beings to human civilization, a complexity profile" NECSI Report YB-0009 (1998) <http://www.necsi.org/Civilization.html>
- 9) Y. Bar-Yam and D. Braha, Asymmetric Topology of Distributed Problem Solving Networks, NECSI Report 2002-11-01 (November 2002).
- 10) Y. Bar-Yam and M. Dierks, Crisis in Medical Care: Spotlight Children's Hospital Boston, NECSI Report 2003-10-01 (October 2003)
- 11) Y. Bar-Yam, Multiscale Variety in Complex Systems, NECSI Report 2003-11-01 (November 2003).
- 12) Y. Bar-Yam, Multiscale analysis of the healthcare and public health system: Organizing for achieving both effectiveness and efficiency, NECSI Report 2004-07-01 (July 2004).
- 13) Y. Bar-Yam, System Care: Multiscale analysis of Medical Errors — Eliminating errors and improving organizational capabilities, NECSI Report 2004-09-01 (September 2004).
- 14) Y. Bar-Yam, Creating an environment for rapid improvement of healthcare quality: Applying evolutionary principles, NECSI Report 2004-11-01 (November 2004).
- 15) Y. Bar-Yam, Improving the effectiveness of healthcare and public health: A multiscale complex systems analysis, NECSI Report 2005-09-01 (September 2005).
- 16) J. Werfel, Y. Bar-Yam, and R. Nagpal. Construction by robot swarms using extended stigmergy. AI Memo AIM-2005-011, MIT Computer Science and Artificial Intelligence Lab (2005).
- 17) Y. Bar-Yam and M. Woolsey, The Future of Democracy? NECSI Report 2007-05-01 (May 2007).
- 18) Y. Bar-Yam, Analyzing the Effectiveness of Social Organizations Using a Quantitative Scientific Understanding of Complexity and Scale, NECSI Report 2007-05-02 (May 2007). PDF File
- 19) Y. Bar-Yam, 2008-10-02: Market Failure: Interdependence in Action, NECSI Report, October 3, 2008.
- 20) Y. Bar-Yam, 2008-10-01: Market Instability and the Uptick Rule, NECSI Report, October 10, 2008.
- 21) D. Harmon and Y. Bar-Yam, Technical Report on the SEC Uptick Repeal Pilot, NECSI Report 2008-11, November 18, 2008.
- 22) Y. Bar-Yam, A Regulatory System for the Financial Sector of Complex Systems Science, Remarks Prepared for Congressman Capuano's Roundtable, March 16, 2009.
- 22) Y. Bar-Yam, D. Harmon, V. Misra, and J. Ornstein, Regulation of Short Selling: The Uptick Rule and Market Stability. Report presented at the Securities and Exchange Commission, February 22, 2010
- 23) Y. Bar-Yam and P. Seguin, Complex Systems Engineering Principles — Active Response and Soft Failure, NECSI Report 2010-09-01 (2010).
- 24) L. Leykum and Y. Bar-Yam, The Rational for System Level Strategies for Infection Control, NECSI Report 2010-08-01 (2010).
- 25) M. Lagi, A.S. Gard-Murray and Y. Bar-Yam, Impact of ethanol conversion and speculation on Mexico corn imports, New England Complex Systems Institute, May 2012.
- 26) K.Z. Bertrand, G. Lindsay, Y. Bar-Yam, Food briefing, NECSI Report 2012-08-01 (8/15/2012).
- 27) Y. Bar-Yam, C. Friedman, Swiss-ification: Syria's Best Chance for Peace, NECSI Report 2013-09-01 (September 4, 2013).

Invited Presentations:

- 1) NATO Advanced Study Institute International Conference on Amorphous Hydrides, Rhodes, Greece, (Sept. 1985)
- 2) 7th Winter Conference on Low Temperature Physics, Cuernavaca, Mexico, (January, 1986)
- 3) Materials Research Society Spring Meeting (April, 1986)
- 4) Workshop on Localized States in Tetrahedrally Bonded Amorphous Solids, Bloomfield Hills, Michigan (June, 1986)
- 5) American Physical Society March Meeting, New York (March, 1987) with E. Kaxiras, K. C. Pandey and J. D. Joannopoulos
- 6) Materials Research Society Spring Meeting (April, 1987)
- 7) Twelfth Int. Conf. on Amorphous and Liquid Semiconductors, Prague, Aug. 1987.
- 8) International Workshop on Physics and Applications of Amorphous Semiconductors, Torino, Sept. 1987
- 9) American Physical Society March Meeting, New Orleans (March, 1988) with Chris G. Van de Walle. and S. T. Pantelides
- 10) Second International Workshop on Physics and Applications of Amorphous Semiconductors, Torino, Sept. 1988
- 11) Second Annual Workshop on Computational Methods for the Electronic Structure and Related Properties of Metallic Alloys, Lexington KY, (May, 1989) with M. Needels, J. D. Joannopoulos and S. T. Pantelides.
- 12) Sixth International Conference on Recent Progress in Many-Body Theories, Arad, (November, 1989)
- 13) Third Annual Workshop on Computational Methods for the Structure of Alloys, Lexington KY, (June, 1990) with M. Needels, J. D. Joannopoulos and S. T. Pantelides.
- 14) Materials Research Society Fall Meeting (November, 1990) with J. D. Joannopoulos, M. Needels, S. T. Pantelides and R. H. Wolfe
- 15) American Physical Society March Meeting, Cincinnati (March, 1991) with T. D. Moustakas
- 16) Sixteenth International Conference on Defects in Semiconductors, Lehigh (July, 1991) with M. Needels, J. D. Joannopoulos, and S. T. Pantelides
- 17) Seminar, Beijing University of Aeronautics and Astronautics, Beijing (July, 1991)
- 18) Materials Research Society Fall Meeting (December, 1991)
- 19) American Physical Society March Meeting, (March, 1992) with J. D. Joannopoulos, M. Needels, S. T. Pantelides and R. H. Wolfe
- 20) Gordon Research Conference on Complex Fluids with M. A. Smith, and Y. Rabin
- 21) Second International Conference on Bioinformatics, Supercomputing, and Complex Genome Analysis, St. Petersburg Beach (June, 1992)
- 22) Workshop on New Directions in Polymer Simulations, CECAM, Orsay (July, 1992) with Y. Rabin and M. A. Smith
- 23) Approaches to the Analysis of Complex Systems in Biomedical Research, Bethesda (Nov, 1997)
- 25) One-Day Seminar, Univ. of Georgia (Jan, 1998)
- 26) Special Meeting on Evolution and Complexity, Cambridge (March, 1998)
- 27) One-Day Seminar, Univ. of Cincinnati (April, 1998)
- 28) Chaos in Manufacturing, Santa Fe (April, 1998)
- 29) WESS: Washington Evolutionary Systems Society, Washington (May, 1998)
- 30) Complex Systems Theory: Analytical Models and Its Applications, Seoul (June, 1998)
- 31) Virtual Worlds, Paris (July, 1998)
- 32) Eighth Annual International Conference of The Society For Chaos Theory in Psychology & Life Sciences, Boston, (July, 1998)
- 33) ACRI 98: Third Int. Conf. on CA for Research and Industry, Trieste, (October, 1998)

- 34) Keynote, III Conference on Complexity in Economics, Lisbon, (May, 1999)
- 35) Complexity Management Forum, Tokyo, (Sept. 1999)
- 36) Chief of Naval Operations Strategic Studies Group, Newport, (January, 2000)
- 37) One-Day Seminar, Universidad de Los Andes, Bogota, (January, 2000)
- 38) Seattle Complexity Meeting, Seattle (March, 2000)
- 39) NATO, Advanced Study Institute on Nonlinear Dynamics in Life and Social Sciences, Moscow, (May, 2000)
- 40) Keynote, World Congress, International Systems Science Society ISSS, Toronto, (July, 2000)
- 41) EMC Seminar (August, 2000)
- 42) One-Day Seminar, MITRE (September, 2000)
- 43) One-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, (December, 2000)
- 44) University of Illinois, Urbana (February, 2001)
- 45) Lehigh University (February, 2001)
- 46) National Science Foundation, Washington, DC (February, 2001)
- 47) One-Day Seminar, Courant Institute, New York University (March, 2001)
- 48) One-Day Seminar, UC Irvine (March, 2001)
- 49) One-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, (March, 2001)
- 50) New York Complex Systems Society (April, 2001)
- 51) One-Day Seminar, Santa Fe Art Institute, Santa Fe (June, 2001)
- 52) Special Libraries Association, San Antonio, TX (June, 2001)
- 53) Interdisciplinary Conference on the Sciences of Complexity, Tokyo, (June, 2001)
- 54) One-Day Seminar Intelligence and International Terrorism, Washington DC (Oct, 2001)
- 55) One-Day Seminar, University of Cincinnati, Cincinnati (Oct, 2001)
- 56) One-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, (Dec., 2001)
- 57) One-Week Course, Introduction to Complex Systems, at MIT, Cambridge, (Jan., 2002)
- 58) Complex Systems and Autonomic Computing, IBM, Yorktown, (Jan, 2002)
- 59) Brookhaven National Laboratory, (Apr., 2002)
- 60) Anton Myrer Leadership Workshop, US Army War College, Carlisle Barracks, PA (June, 2002)
- 61) Multiscale Complex Systems Analysis and Evolutionary Engineering, Half-day program, MITRE, Bedford, MA (Sept., 2002)
- 62) Multiscale Complex Systems Analysis and Evolutionary Engineering, Full-day program, MITRE, Bedford, MA (Oct., 2002)
- 63) Multiscale Complex Systems Analysis and Evolutionary Engineering, Three day program, Boeing, Seattle, WA (Oct. 2002)
- 64) One-Day Course, USGS, Reno (Nov. 2002)
- 65) Workshop on Modeling Complex Systems, USGS (Nov. 2002)
- 66) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Dec. 2002)
- 67) Multiscale Complex Systems Analysis and Evolutionary Engineering, Full-day program, Air-Force Office of Transformation and MITRE, Bedford, MA (Feb., 2002)
- 68) 21st Century Warrior, Strategic Studies Group. Cambridge, MA (Feb. 2002).
- 69) Multiscale Complex Systems Analysis and Evolutionary Engineering, Half day seminar, DoD Office of Force Transformation, Washington DC, (March, 2003)
- 70) Complex Systems and Sports, Barcelona (May, 2003)
- 71) Boeing Leadership Development Course, St. Louis (May, 2003)

- 72) INTEREP two day program, (May, 2003)
- 73) Revolutionary War Game, Newport, RI, (June 2003)
- 74) Special MITRE course, Multiscale Complex Systems Analysis and Evolutionary Engineering, One Week Course, Bedford, MA, (June. 2002)
- 75) Center for Disease Control, Senior Leadership Meeting, Atlanta (June, 2003)
- 76) INTEREP two day program, (July 2003)
- 77) Special MITRE course, Multiscale Complex Systems Analysis and Evolutionary Engineering, One Week Course, Bedford, MA, (Sept. 2002)
- 78) IEEE International Conference on Systems, Man & Cybernetics, Washington, D.C (Oct. 2003)
- 79) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Nov. 2003)
- 80) Biocomplexity Seminar, Indiana University (Jan. 2004)
- 81) Multiscale Complexity and Engineering, BBN, Cambridge MA (Jan, 2004)
- 82) Systems Based Practice, Children's Hospital Boston, (Jan, 2004)
- 83) Systems Engineering Seminar, INCOSE-NE, Waltham MA (Feb, 2004)
- 84) Systems based practice, One day course, Stockholm, Sweden (March, 2004)
- 85) Managing Complex Healthcare Organizations, Two-day Course, Swedish County Councils, Stockholm, Sweden (April, 2004)
- 86) Managing Complex Organizations, Two-day Course, Open program, Stockholm, Sweden (April, 2004)
- 87) Managing Complex Organizations and Third World Development, Two day course, World Bank Institute, World Bank, Washington DC (June, 2004)
- 88) Models of Thought Processes, National Science Foundation, Wash, DC (June, 2004)
- 89) Workshop on Engineering Self-organizing Applications (ESOA) at AAMAS, New York, (July, 2004)
- 90) Multiscale Complex Systems Analysis and Evolutionary Engineering, Three Day Course, Colorado Springs, CO, (July, 2004)
- 91) Managing Complex Organizations and Third World Development, Second level program, World Bank Institute, World Bank, Washington DC (Sept, 2004)
- 92) Managing Complex Healthcare Organizations, One Day Course, Baptist Memorial Healthcare, Memphis, TN (Oct., 2004)
- 93) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Dec. 2004)
- 94) Managing Complex Organizations in a Complex World, One day seminar, 16th National Forum on Quality Improvement in Health Care, Orlando, FL (Dec. 2004)
- 95) Modeling & Simulations, Plenary, 19th annual Primary Care Research Methods & Statistics Conference, San Antonio, TX, (December, 2004)
- 96) Complex Systems and International Security, MITRE McLean Campus, Washington DC, (Feb. 2005)
- 97) Complex Systems Insights and their Application, ½ day workshop, International Conference on Intelligence Analysis, Washington DC, (May, 2005)
- 98) Complexity Science and its Applications to Intelligence Problems, CIA, (July, 2005)
- 99) Introduction to Complex Systems, Australian Graduate School of Management, Sydney, Australia (December 2005)
- 100) Complexity and Public Policy, The Fletcher School, Graduate School of International Affairs, Medford MA (February, 2006)
- 101) Forum on Complexity and Public Policy, Capitol Hill, Washington DC (March, 2006)
- 102) Complexity Science and its Applications to Intelligence Problems, NSA, (May, 2006)
- 103) Keynote, "From The Evolution Of Altruism To Pandemic Extinction Of Human Civilization" Understanding Complex Systems Symposium, Urbana-Champaign, IL (May, 2006)

- 104) The Dynamics of Complex Systems. Plenary, 50th International Systems Science Symposium 2006 (ISSS), Sonoma, CA (July 2006).
- 105) Complex Systems Special Session, INCOSE Symposium, Orlando, FL (July, 2006)
- 106) Introduction to Complexity Theory, Seminar on Transportation Sector Risk Management, Transportation Security Agency (TSA), Washington DC (August, 2006)
- 107) Plenary, Workshop on Modeling Social Dynamics, NSF Washington DC (October, 2006)
- 108) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Nov. 2006)
- 109) Complexity and International Development, The Fletcher School, Graduate School of International Affairs, Medford MA (December, 2006)
- 110) Use of Concepts from Complexity Theory, Two-Day workshop, Defense Research and Development Canada, Valcartier, Quebec (December 2006)
- 111) Complexity and International Relations, Complexity and Negotiation (two seminars) Boston University, Boston MA (Feb. 2007)
- 112) Introduction to Complex Systems, One-Day course, Undersea Distributed Networked Systems Conference, Undersea Warfare Center, Newport, RI (Feb. 2007)
- 113) The Science of Retail Prevention, One-Day Program, Invitation of CDC and NECSI at MIT, Cambridge, MA (April 2007)
- 114) Agent-based modeling seminar at MIT, (May, 2007)
- 115) Complex systems half-day program, SASO 2007: First IEEE International Conference on Self-Adaptive and Self-Organizing Systems. MIT (July 2007)
- 116) Mobilizing Aid for Trade: Focus Asia-Pacific, WTO and Asian Development Bank, Manila, Philippines (Sept, 2007)
- 117) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Oct. 2007)
- 118) Keynote, NIH Integrative Cancer Biology Program (ICBP), Washington, DC (Nov. 2008)
- 119) One-day Seminar, Centers for Disease Control and Prevention, Atlanta, GA (March, 2008)
- 120) Second One-day Seminar, Centers for Disease Control and Prevention, Atlanta, GA (March, 2008)
- 121) Four invited seminars, Centers for Disease Control and Prevention, Atlanta, GA (April, 2008)
- 122) Keynote, "Global patterns and ethnic violence" Understanding Complex Systems Symposium, Urbana-Champaign, IL (May, 2008)
- 123) The Uptick Rule and the Economic Crisis, NY Fed Reserve Bank, New York, Dec. 16, 2008.
- 124) Invited presentation: Complex Systems: Quantitative Approaches with Policy Implications, Air Force Office of Scientific Research, Arlington, VA, May 13, 2009.
- 125) Invited presentation: Structuring the Smart Grid Framework: Application of Complex Systems Engineering, for the NAS/NAE/IOM Committee on Science, Engineering, and Public Policy (COSEPUP), National Academies Keck Center, Washington, DC, May 15, 2009
- 126) Invited presentation: The Uptick Rule and the Economic Crisis, Boston Fed Reserve Bank, Boston, Oct. 15, 2009.
- 127) Invited Presentation: The Uptick Rule and the Economic Crisis, at the Securities and Exchange Commission, February 22, 2010
- 128) Invited two day presentation: Complex Systems, United States Army Corp of Engineers (USACE), Washington DC, April 2010.
- 129) Invited one day seminar, CNO Strategic Studies Group, Nov 9, 2010.
- 130) Human Social Culture Behavior (HSCB) Modeling Program Focus 2011 Conference, February 2011, Virginia, USA.
- 131) World Economic Forum, Davos, Switzerland (Jan, 2012)

- 132) Invited seminar: Complex Systems Principles and Education: Focusing on Universal Principles and Individual Differences, Kaput Center at the University of Massachusetts Dartmouth, (March, 2012)
- 133) Invited seminar: Food Innovation Summit, Wageningen, The Netherlands (June, 2012) (remote)
- 134) Keynote, Society for Chaos Theory on Psychology and Life Sciences (SCTPLS) Baltimore (July, 2012)
- 135) Invited presentation, International Symposium on Economics in a Complex World: Networks and Agents, Madrid, (September, 2012) (remote)
- 136) Invited Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Nov. 2012)
- 137) Invited presentation, The physics of evolution and biodiversity: Old answers to new questions, and more...American Physical Society March Meeting, Baltimore MD (March, 2013)
- 138) Invited seminar: Complex Systems science: Solving Complex Problems in a Complex World, Johns Hopkins Global Center on Childhood Obesity Baltimore MD (March, 2013)
- 139) Invited presentation, Amnesty International and other NGOs, PFWZ, Netherlands (April, 2013)
- 140) Invited half day workshop, Packard Foundation program on biofuels and biomass, Washington DC (May, 2013)
- 141) Invited presentation, Chicago Council on Global Affairs Global Food Security Symposium 2013, Capitalizing on the Power of Science, Trade, and Business to End Hunger and Poverty, Washington DC (May, 2013)
- 142) Invited seminar, Board on Agriculture and Natural Resources (BANR), National Academy of Sciences, Washington DC (May, 2013)
- 143) Invited discussion, Chairman of the Joint Chiefs strategy group, Pentagon, (May, 2013)
- 144) Invited presentation, Tällberg Invited Initiative Meeting on Navigating New Risk Landscapes & Opportunities in Global Food Systems (June, 2013)
- 145) Keynote, 2013 Interdisciplinary Symposium on Complex Systems, Prague, Czech Republic (Sept, 2013)
- 146) Invited seminar, UN Food and Agricultural Organization, Rome (Sept, 2013)
- 147) Invited seminar, UN World Food Program, Rome (Sept, 2013)
- 148) Half-Day Seminar, Chief of Naval Operations Strategic Studies Group, Newport, RI (Oct. 2013)
- 149) Invited seminar, MIT Media Laboratory (Nov. 2013)
- 150) Invited seminar, Visualizing the Global Agricultural System, GEO Meeting, Geneva (Jan. 2014)
- 151) Invited seminar, UN World Health Organization, Geneva (Jan. 2014)
- 152) Invited seminar, International Fund for Agriculture and Development, Rome (Jan. 2014).
- 153) Invited seminar, Clinton Global Initiative Winter Meeting, NY (Feb 2014)
- 154) Invited seminar, US Department of Agriculture, Washington DC (March. 2014)
- 155) Distinguished Speaker Seminar, Northwestern University, Chicago (March 2014)
- 156) Invited symposium: Applications of Complex Systems Science in Obesity and Non-Communicable Chronic Disease Research, American Society for Nutrition, EB 2014, San Diego (April, 2014).
- 157) Invited panelist and moderator, The Ecology of Digital Assets, MIT Media Lab, Cambridge, MA (July, 2014)
- 158) Keynote, Wikimania 2014, London, (August, 2014)
- 159) Invited presentation, Complex Systems Workshop, Sao Paulo Brazil, (October, 2014)
- 160) Invited seminar, Complex Systems and Policy, Instituto de Pesquisa Econômica Aplicada - Ipea, Brasilia, Brazil (October, 2014).
- 161) Invited panelist, National Counterterrorism Center (NCTC), Washington, DC (Nov., 2014)
- 162) Invited seminar, Psychology Department, University of Connecticut, CT (Nov. 2014)
- 163) Invited seminar, Cornell University, Ithaca, NY (Nov. 2014)
- 164) Invited seminar, Perimeter Institute, Toronto, CA (Nov. 2014)
- 165) Invited presentations, Commonwealth Partnership for Technology Management, London, UK (Dec. 2014)

- 166) Invited seminar, Complex Systems Science and Global Crises: From The Global Food Crisis to the Ebola Epidemic, Afeka, Israel (Dec. 2014)
- 167) Invited panelist, National Counterterrorism Center (NCTC), Washington, DC (Jan. 2014)
- 168) Invited presentation with Nassim Nicholas Taleb, Risk, National Intelligence Council, Directorate of National Intelligence, Washington DC (Feb. 2015)
- 169) Invited presentation, 51st annual Senior Conference, "Counterterrorism: Unconventional Approaches to an Unconventional Threat," West Point, NY (Apr. 2015).
- 170) Invited seminar, Physics department, Wellesley College, Wellesley MA (Sept. 2015)
- 171) Opening Keynote presentation, Conference on Complex Systems, Arizona (Sept. 2015)
- 172) Keynote presentation, CoCo kick off conference, SUNY Binghamton (Oct. 2015)
- 173) Invited presentation, Urban physics symposium, MIT (March 2016)
- 174) Invited presentation, National Academy of Sciences Symposium, Washington DC (May, 2016)
- 175) Multiple invited presentations, Singapore (June, 2016)
- 176) Invited seminar, Complex systems, US State Department, Washington DC (Aug. 2016)
- 177) Keynote, Complexity Science and Health Services Research: Research Priorities, Methodological Approaches, Capacity Building, VA, UT Health Science Center at San Antonio (Sept. 2016) (remote)
- 178) Invited seminar, Complexity and Energy, University of Texas, Austin TX (Sept. 2016) (remote)
- 179) Invited presentation, SMASH2016 media summit, WGBH, Boston (Sept. 2016)
- 180) Invited presentation, Real World Risk Institute, New York (Sept. 2016)
- 181) Invited seminar, Ethnic violence, US State Department, Washington DC (Nov. 2016)
- 182) Invited seminar, Amy Research Office, Maryland (Nov. 2016)
- 183) Hiroki Sayama and Yaneer Bar-Yam, Formulating evolutionary dynamics of organism-environment couplings using graph product multilayer networks, a talk at PhysPlex II: Second Satellite Symposium on Multilayer and Interconnected Networks: Applications, at Conference on Complex Systems 2017, September 21, 2017, Cancun, Mexico. (remote)
- 184) Invited Keynote, Complexity science for boosting security, Conference on Complex Systems, Cancun Mexico (Sept. 2017). (remote)
- 185) Invited Keynote, Understanding Our Complex World through Data Analytics and Modeling, Conference on Complex Systems, Cancun Mexico (Sept. 2017). (remote)
- 186) Invited Keynote, Understanding the Dynamics of Conflict and Violence Satellite Session, Conference on Complex Systems, Cancun Mexico (Sept. 2017). (remote)
- 187) Invited presentation, Global Transformation of Societies: Implications for Business and National Security, Dallas Committee on Foreign Relations, Global Risk Series, Dallas, Texas (Sept, 2017) (remote)
- 188) Invited keynote, Governing Council Meeting Common Fund for Commodities, The Hague, Netherlands (December, 2017)
- 189) Invited keynote, Workshop on data analysis in large-scale research: Comparing experiences in physics and biology, CERN, Geneva Switzerland (December 2017) (remote)
- 190) Invited One Day Executive Program, Talla Corporation, Boston, MA (April 4, 2018)
- 191) Invited keynote, Complexity And Policy Studies CAPS 2018, Washington DC (April 2018)
- 192) Invited keynote, Complex Systems Science, NERCCS 2018, Binghamton, NY (April 2018)
- 193) Invited presentation, Capital Fund Management, Spring Seminar, NY (May 10, 2018)
- 194) Invited presentation, Game Theory and Nuclear Stability in Northeast Asia, Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland (August, 2018).
- 195) Invited keynote, What can science say about where the world is going? Retreat of the Volen Center for Complex Systems at Brandeis University, Metropolitan Waterworks Museum in Chestnut Hill, Brookline MA

(Oct 2018)

- 196) Invited keynote, NDUS AI/Future Technologies Conference (November 2018).
- 197) Invited presentation, Understanding Mission-Driven Resiliency Workshop hosted by Lincoln Laboratory at MIT (Cambridge, MA on March 18th, 2019)
- 198) Invited presentation, Global Insurance Summit presented by TransRe and Ultimate Risk Solutions (New York City, NY on May 15th, 2019)
- 199) Invited presentation, 3PL & Supply Chain Summit: Atlanta presented by eft (Atlanta, GA on June 10-12, 2019)
- 200) Invited Keynote, Complex systems, Carderock, Washington DC (August, 2019)
- 201) Invited presentation, Introduction to Concepts of Complexity Science presented by the Potomac Institute for Policy Studies (Washington DC on November 20th, 2019)
- 202) Invited presentation, Complex systems, Ukraine (November, 2019) (remote)
- 203) **Multiple invited presentations on Coronavirus outbreak, 2020-1**

NECSI Program Presentations:

- 1) One-Day Seminar, at MIT (Jan, 1998)
- 2) Planning Meeting for a National Initiative on Complex Systems in K-16 Education, Boston, (June, 1999)
- 3) Intensive course on complex systems, Boston (Oct., 1999)
- 4) One-Day Seminar, at MIT (September, 2000)
- 5) Managing Complex Organizations in a Complex World, Cambridge (May, 2001)
- 6) Managing Complex Organizations in a Complex World, Cambridge (Nov, 2001)
- 7) One Day Seminar at Harvard University, (Apr., 2002)
- 8) Managing Complex Organizations in a Complex World, Cambridge (May, 2002)
- 9) One day seminar at MIT, Cambridge, MA (Oct. 2002)
- 10) Managing Complex Organizations in a Complex World, Cambridge (Nov, 2002)
- 11) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge, MA (Jan, 2003)
- 12) Managing Complex Organizations in a Complex World, Cambridge MA (May, 2003)
- 13) Introduction to Complex Systems, One-Week Course, UCLA (June, 2003)
- 14) Modeling Complex Systems, at MIT, Cambridge, MA (Nov. 2003)
- 15) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge, MA (Jan, 2004)
- 16) Healthcare Initiative, Cambridge, MA (Feb, 2004)
- 17) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge (June, 2004)
- 18) Healthcare Initiative, Two day second level program, Cambridge, MA (Aug, 2004)
- 19) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge, MA (Jan, 2005)
- 20) Managing Complex Organizations in a Complex World, Cambridge (Feb. 2005)
- 21) Complex Systems and International Security, MITRE McLean Campus, Washington DC, (Feb. 2005)
- 22) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge (June, 2005)
- 23) One-Day seminar at MIT, Cambridge (September, 2005)
- 24) Introduction to Complex Systems, Australian Graduate School of Management, Sydney, Australia (December 2005)
- 25) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge (Jan. 2006)
- 26) Introduction to Complex Systems, One-Week Course, at MIT, Cambridge (June. 2006)

- 27) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January. 2007)
- 28) Leading with Confidence in the Face of Uncertainty, Two day program, MIT (May, 2007)
- 29) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June. 2007)
- 30) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January. 2008)
- 31) Introduction to Complex Systems, Three-Week Summer School, at MIT, Cambridge (June. 2008)
- 32) Introduction to Complex Systems, Three-Week Winter School, at MIT, Cambridge (January. 2009)
- 33) Introduction to Complex Systems, Three-Week Summer School, at MIT, Cambridge (June. 2009)
- 34) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January. 2010)
- 35) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June. 2010)
- 36) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January. 2011)
- 37) MIT ESD and NECSI Seminar: Complex Systems: The Challenge of Prediction, (April, 2011)
- 36) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June. 2011)
- 36) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (Jan. 2012)
- 36) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June. 2012)
- 37) Science of the Food Crisis, Online seminar (Oct 2012)
- 38) After Sandy: Preparing for Crises, Online seminar (Nov 2012)
- 39) What is complex systems science: Opportunities and insights, Online seminar (Dec 2012)
- 40) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (Jan. 2013)
- 41) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June. 2013)
- 42) Antifragile: A Users Manual, Two-Day Executive Education Program, Cambridge (November, 2013)
- 43) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (Jan. 2014)
- 44) Sociophysics, Public Seminar at the MIT Museum (April 2014)
- 45) Antifragile: A Users Manual, Two-Day Executive Education Program, Cambridge (May, 2014)
- 46) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June, 2014)
- 47) Ethnic violence, NECSI Salon (December, 2014)
- 48) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (Jan, 2015)
- 49) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (June, 2015)
- 50) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (Jan, 2016)
- 51) Antifragile, Two day executive program, Boston (Jan, 2015)
- 52) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June, 2016)
- 53) Artificial and Human Intelligence, One week executive program, Boston (November, 2017)
- 54) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (January, 2017)
- 55) Risk and Strategy in a Changing World, One week executive program, Washington DC (May, 2017)
- 56) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June, 2017)
- 57) AI and Beyond, One week executive program, Boston (October, 2017)
- 58) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (January, 2018)
- 59) AI and Beyond, One week executive program, Boston (February, 2018)
- 60) Strategic Analytics, One week executive program, Washington DC (April, 2018)
- 61) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June, 2018)
- 62) Strategic Analytics, One week executive program, Washington DC (October, 2018)

- 63) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January, 2019)
- 64) Introduction to Complex Systems, Two-Week Summer School, at MIT, Cambridge (June, 2019)
- 65) Strategic Analytics, Two day executive program, Washington DC (November, 2019)
- 66) Introduction to Complex Systems, Two-Week Winter School, at MIT, Cambridge (January, 2020)