Hazhir Rahmandad

Professor of System Dynamics and Schussel Family Professor of Management Science
MIT Sloan School of Management, System Dynamics Group

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EDUCATION

Massachusetts Institute of Technology
Ph.D. in Management, System Dynamics - Minor Organizational Behavior — August 2005

Sharif University of Technology
Bachelor of Science in Industrial Engineering - Minor System Analysis — 1996-2000

POSITIONS AND PROFESSIONAL EXPERIENCES

Massachusetts Institute of Technology

Professor, Sloan School of Management — 2024-
Associate Professor, Sloan School of Management (with tenure) — 2020-2024
Associate Professor, Sloan School of Management (without tenure) — 2016-2020
Assistant Professor, Sloan School of Management — 2015-2016

Virginia Tech

Associate Professor of Industrial and Systems Engineering (with tenure) — 2012-2015
Assistant Professor of Industrial and Systems Engineering — 2006-2012

Massachusetts Institute of Technology

Visiting Associate Professor, Sloan School of Management — 2013-2015
Post Doctoral Associate — 2005- 2006

Avaya Corp.

Research Affiliate — 2004-2007
Consultant — 2005-
McClatchy-Tribune, IBM, Kids Risk, PWC

REFEREED JOURNAL ARTICLES

1. Sassine, Jad Georges, and Hazhir Rahmandad (2024). "How Does Network Structure Impact Socially Reinforced Diffusion?." ***Organization Science***. 35 (1), 52-70.
2. Lim, T.Y., R. Xu, N. Ruktanonchai, O. Saucedo, L. Childs, M. Jalali, H. Rahmandad, N. Ghaffarzadegan (2023) "Why Similar COVID-19 Policies Resulted in Different Outcomes: a Global Behavioral Perspective", ***Health Affairs***, 42 (12), 1637-1646
3. Kelly, E. L., Rahmandad, H., Wilmers, N., & Yadama, A. (2023). How Do Employer Practices Affect Economic Mobility?. ***ILR Review***, 76(5), 792-832.
4. Rahmandad, Hazhir, and Michael Shayne Gary. (2023) "Delays impair learning and can drive convergence to inefficient strategies." ***Organization Science***. 34 (6), 2392-2414.
5. Rahmandad, Hazhir, Ran Xu, and Navid Ghaffarzadegan. (2022) "A missing behavioural feedback in COVID-19 models is the key to several puzzles." ***BMJ global health*** 7(10): e010463.
6. Rahmandad, Hazhir, and John Sterman. (2022) "Quantifying the COVID-19 endgame: Is a new normal within reach?" ***System Dynamics Review*** , 38(4), 329-353.
7. Rahmandad, H. (2022). Behavioral responses to risk promote vaccinating high-contact individuals first. ***System Dynamics Review***, *38*(3), 246-263. doi:10.1002/sdr.1714
8. Rahmandad, Hazhir, Ran Xu, and Navid Ghaffarzadegan. (2022) "Enhancing Long-term Forecasting: Learning from COVID-19 Models." ***PlOS Computational Biology***, 18(5), e1010100
9. Xu R, Rahmandad H, Gupta M, DiGennaro C, Ghaffarzadegan N, Amini H, Jalali MS (2021) The Impact of Weather and Air Pollution on SARS-CoV-2 Transmission. ***Lancet Planetary Health*** 5.10: e671-e680.
10. Jalali MS, DiGennaro C, Guitar A, Lew K, Rahmandad H (2021) Evolution and Reproducibility of Simulation Modeling in Epidemiology and Health Policy over Half a Century. ***Epidemiologic Reviews***. 43.1: 166-175

11. Rahmandad H, Lim T, Sterman J (2021) Behavioral dynamics of COVID-19: estimating underreporting, multiple waves, and adherence fatigue across 92 nations. ***System Dynamics Review*** 37(1):5-31.
12. Rahmandad H, Denrell J, Prelec D (2021) What makes dynamic strategic problems difficult? Evidence from an experimental study. ***Strategic Management Journal*** 42(5):865-897.
13. Ghaffarzadegan, N., Rahmandad, H. (2020) Simulation-based estimation of the early spread of COVID-19 in Iran: actual versus confirmed cases. ***System Dynamics Review****,* 36(1):101-129
14. Rahmandad, H., & Ton, Z., (2020) "If higher pay is profitable, why is it so rare? Modeling competing strategies in mass market services." ***Organization Science****.* 31(5):1053-1071
15. Rahmandad, H., Vakili, K. (2019). "Explaining heterogeneity in the organization of scientific work." ***Organization Science.*** 30(6): 1125-1145.
16. Rahmandad, H. (2019). "Interdependence, Complementarity, and Ruggedness of Performance Landscapes." ***Strategy Science*** 4 (3): 234-249.
17. Jalali, M.S., H. Rahmandad, S.L. Bullock, S.H. Lee-Kwan, J. Gittlesohn, A. Ammerman (2019). "Dynamics of Intervention Adoption, Implementation, and Maintenance Inside Organizations: the Case of an Obesity Prevention Initiative." **Social Science and Medicine**, 224 (3): 67-76.
18. Rahmandad, H., R. Henderson and N. P. Repenning (2018). "Making the Numbers? "Short Termism" and the Puzzle of Only Occasional Disaster." ***Management Science*** 64(3): 1328-1347.
19. Hosseinichimeh, N., Wittenborn, A. K., Rick, J., Jalali, M. S., & Rahmandad, H. (2018). Modeling and estimating the feedback mechanisms among depression, rumination, and stressors in adolescents. ***PloS one***, *13*(9), e0204389.
20. Rad, A. A., H. Rahmandad and M. Jalali (2018). "How Exposure to Different Opinions Impacts the Life Cycle of Social Media." ***Annals of Operations Research***. 268(1-2): 63-91.
21. Jalali, M. S., H. Rahmandad, S. L. Bullock and A. Ammerman (2017). "Dynamics of Implementation and Maintenance of Organizational Health Interventions." ***International Journal of Environmental Research and Public Health*** 14(8).
22. Rahmandad, H., M. S. Jalali and K. Paynabar (2017). "A flexible method for aggregation of prior statistical findings." ***Plos One*** 12(4).
23. Rahmandad H, Repenning N. (2016). "Capability Erosion Dynamics." ***Strategic Management Journal***. 37(4): 649-672.
24. Hosseinichimeh, N., H. Rahmandad, M. S. Jalali and A. K. Wittenborn (2016). "Estimating the parameters of system dynamics models using indirect inference." ***System Dynamics Review*** 32(2): 154-178.
25. Jalali, M. S., Sharafi-Avarzaman, Z., Rahmandad, H., & Ammerman, A. S. (2016). Social influence in childhood obesity interventions: a systematic review. ***Obesity Reviews***. doi: 10.1111/obr.12420
26. Wittenborn, A., H. Rahmandad, J. Rick and N. Hosseinichimeh (2016). "Depression as a systemic syndrome: Mapping the feedback loops of major depressive disorder." ***Psychological Medicine.*** 46(3): 551-562.
27. Rahmandad, H. (2015). "Connecting strategy and system dynamics: an example and lessons learned." ***System Dynamics Review*** 31(3): 149-172.
28. Parvan, K., Rahmandad, H., & Haghani, A. (2015). Inter-phase feedbacks in construction projects. ***Journal of Operations Management*** 39-40: 48-62.
29. Hosseinichimeh, N., H. Rahmandad and A. Wittenborn (2015). "Modeling the hypothalamus-pituitary-adrenal axis: A review and extension." **Mathematical biosciences.** 268: 52-65.
30. Davarzani, H., R. Zanjirani-Farahani and H. Rahmandad (2015). "Understanding econo-political risks: impact of sanctions on an automotive supply chain." ***International Journal of Operations & Production Management***. 35(11):1567-1591.
31. Shoham, D., R. Hammond, H. Rahmandad, Y. Wang and P. Hovmand (2015). "Modeling social norms and social influence in obesity." ***Current Epidemiology Reports*** 2(1): 71-79.
32. Fallah-Fini, S., K. Triantis, H. Rahmandad, C. de la Garza (2015). "Measuring dynamic efficiency of highway maintenance operations." ***Omega***.50(C):18-28.
33. Rahmandad H. (2014). "Human growth and body weight dynamics: an integrative systems model." ***PLoS One****.* 9(12): e114609.
34. Fallah-Fini, S., H. Rahmandad, et al. (2014). "Modeling US Adult Obesity Trends: A System Dynamics Model for Estimating Energy Imbalance Gap." ***American Journal of Public Health***. 104(7): 1230-1239.
35. Hall, K. D., R. A. Hammond, H. Rahmandad (2014). "Dynamic Interplay Among Homeostatic, Hedonic, and Cognitive Feedback Circuits Regulating Body Weight." ***American Journal of Public Health***. 104(7): 1169-1175.
36. Fallah-Fini, S., H. Rahmandad, et al. (2013). "Connecting micro dynamics and population distributions in system dynamics models." ***System Dynamics Review*** 29(4): 197-215.
37. Sabounchi, N., Rahmandad, H., Ammerman, A. (2013). "Best-fitting prediction equations for basal metabolic rate: informing obesity interventions in diverse populations." ***International Journal of Obesity***.37(10): 1364-1370.

38. Ip, E. H., H. Rahmandad, D. Shoham, R. Hammond, T. Huang, Y. Wang, P. Mabry (2013) "Reconciling Statistical and Systems Science Approaches to Public Health " ***Health Education & Behavior***.40(1S): 123S-131S.
39. Rahmandad, H. (2012). "Impact of growth opportunities and competition on dynamics of capability development". ***Organization Science*** 23(1): 138-154.
40. Rahmandad, H. and Sterman, J. (2012). "Reporting Guidelines for Simulation-based Research in Social Sciences." ***System Dynamics Review***, 28(4):396-411.
41. Rahmandad, H. and Sibdari, S. (2012) "Joint Pricing and Openness Decisions in Software Markets with Reinforcing Loops." ***System Dynamics Review*** 28(3):206-229.
42. Hu, K., Rahmandad, H., Smith-Jackson, T., & Winchester, W. W. (2011). Factors influencing the risk of falls in construction industry: a review of evidence. ***Construction Management and Economics***, 29(4): 397-416.
43. Rahmandad, H., K. Hu, R. Duintjer-Tebbens, K. Thompson (2011). Development of an individual-based model for polioviruses: Implications of the selection of network type and outcome metrics. ***Epidemiology and Infection***, 139(6), 836-848.
44. Zuashkiani, A., Rahmandad, H., & Jardine, A. (2011). Mapping the dynamics of overall equipment effectiveness to enhance asset management. ***Journal of Quality in Maintenance Engineering***, 17(1), 74-92.
45. Fallah-Fini, S., H. Rahmandad, et al. (2010). "Optimizing highway maintenance operations: dynamic considerations." ***System Dynamics Review*** 26(3): 216-238.
46. Rahmandad, H. and K. Hu (2010). "Modeling rework cycle: comparing alternative formulations." ***System Dynamics Review*** 26(4): 291-315.
47. Rahmandad, H., N. P. Repenning and J. D. Sterman (2009). Effect of Feedback Delays on Learning, ***System Dynamics Review***, 25(4): 309-338.
48. Rahmandad, H. and D. Weiss (2009). Dynamics of concurrent software development. ***System Dynamics Review*** 25(3): 224-249.
49. Rahmandad, H. (2008). "Effect of delays on complexity of organizational learning." ***Management Science*** 54(7): 1297-1312.
50. Rahmandad, H. and J. Sterman (2008). "Heterogeneity and network structure in the dynamics of diffusion: Comparing agent-based and differential equation models." ***Management Science*** 54(5): 998-1014.

Publication Download link: https://www.dropbox.com/s/b8dkz5r0fqiwexd/RahmandadPubs.zip?dl=0

OTHER PUBLICATIONS AND MEDIA COVERAGE

Book

- Rahmandad, H., Oliva, R. & Osgood, N. (2015), Analytical methods for dynamic modelers. Cambridge: MIT Press.

Book Chapters and Reports

- Kelly, E., H. Rahmandad, N. Wilmers and A. Yadama (2022) Employer Practices and Worker Outcomes, WorkRise Research Report
- Jalali, M., Rahmandad, H., & Ghoddusi, H. (2015). Using the method of simulated moments for system identification. In H. Rahmandad, R. Oliva & N. Osgood (Eds.), Analytical methods for dynamic modelers. Cambridge: MIT Press.
- Rahmandad, H. and R. Spiteri (2015). Modeling competing actors using differential games. Analytical methods for dynamic modelers. H. Rahmandad, R. Oliva and N. Osgood. Cambridge, MIT Press.

Media Coverage of Research

- New York Times, Washington Post, BBC, Boston Globe, Newsweek, India Times, UK SUN, Tech Times, Turkish Milliyet, WBUR, VOA, India Today, La Nacion, Nature, The Economist, The Hill

TEACHING AND ADVISING

MIT Teaching

• 15.871 Introduction to System Dynamics	2013-
• 15.872 System Dynamics II	2013-2018
• 15.873 System Dynamics for Business and Policy	2019-
• 15.879 System Dynamics Ph.D. Seminar	2014-

Virginia Tech Teaching

• ENGR 5004 Systems Engineering Process	2009-2013
• ISE 6024 Advanced Dynamic Modeling	2008, 2009, 2012
• ENGR 5104 Applied Systems Engineering	2006-2012
• ISE 5015 Management of Change, Innovation, & Performance	2008
• ISE 5134 Management Information Systems	2007

PhD thesis supervisor

- ***Graduates (current position):*** James Paine (Faculty, Bucknell), Tiyani Li (Faculty, CUHK), Jad Sassine (Research Scientist, Amazon), TY Lim (Researcher, Harvard), Mahdi Hashemian (Faculty, Koc), James Houghton (Post-doc, UPenn), Mohammad Jalali (Faculty, Harvard Medical School), Armin Ashouri (Data Scientist), Saeedeh Fallah-Fini (Faculty, CalPoly Pomona), Nasim Sabounchi (Faculty, CUNY), Maggie Hu (Product Manager)
- ***Current PhD Students:*** Arya Yadama

FUNDED RESEARCH

- RAISE:IHBEM Mathematical and Algorithmic Formulation of Change in Human Behavior in Epidemic Models, $890,000, 01/2023-12/2027. PI: Navid Ghaffarzadegan, Co-I: Hazhir Rahmandad
- Long-term tracking of how a cluster randomized experiment introducing health and wellbeing committees to warehousing operations impact employee well being and health outcomes, Harvard School of Public Health (Primary: NIOSH), $638,866, 09/2021-08/2026. PI: Erin Kelly, Co-I, H. Rahmandad.
- Producing a report on how various employer practices impact employee outcomes related to mobility. Urban Institute, $11,000, 06/2021-12/2021, PI: Erin Kelli, Co-I: Hazhir Rahmandad.
- A warehouse work design experiment. Washington Center for Equitable Growth, $80,000, 9/2019-7/2020. PI: Erin Kelli, Co-I: Hazhir Rahmandad.
- Unintended Consequences of Scheduling Strategies in Warehouse Work, MIT Sloan Junior Faculty Research Assistance Program, $32,140, 6/1/2019-6/1/2020.
- Can more be less? Impact of habits and cognitive dissonance on adoption under repeated exposures. MIT Sloan Junior Faculty Research Assistance Program, $32,478, 2018-2019, Co-PI: Eckles
- Experimental evidence for capability traps in managing service operations, MIT Sloan Junior Faculty Research Assistance Program, $23,500, 2017-2018
- Systems Analysis of Social Pathways of Epidemics to Reduce Health Disparities, National Institutes of Health (Grant # 1R01GM109718), $1,757,042, 2014-2019, Co-PIs: Abbas & Marathe.
- Analyzing and improving technology investment decisions at hospitals, AHRQ, $100,000, 2013-2014, Co PI: Wernz.
- Modeling the dynamics of adult depression, NIH, $417,858, 2014-2015 Co-PI: Wittenborn.
- Dynamics of obesity intervention adoption, implementation, and maintenance, National Institutes of Health (Grant # 1R21HL113680-01), $408,951, 2012-2014, Co-PI: Ammerman.
- Impact of market behavior on the adoption and diffusion of innovative green building technologies in residential firms, Department of Housing and Urban Development, $363475, 2011-2013, Co PIs: McCoy and Koebel.
- Modeling and analyzing the governance of NextGen, Sponsor: Federal Aviation Administration (FAA) (Virginia Tech is subcontractor to Stevens Institute of Technology), Funding Amount: $40,000, Period: 2011
- Understanding the dynamics of online communities, Sponsor: National Science Foundation (Innovation and Organizational Sciences; Grant # 1027413), Funding Amount: $149,136, Period: 2011-2014
- Modeling obesity dynamics in the U.S., Sponsor: National Institutes of Health (Contract #: HHSN276201000004C), Funding Amount: $247,197, Period: 2010-2012.
- Applications of Web 2.0 in innovation process, Sponsor: Companies PRTM and UPM, Funding Amount: $28,820, Period: 2009-2009.
- Efficiency and workflow analysis at MCT, Sponsor: MCT Information Services, Funding Amount $32,130, Period: 2008, Co PIs: Triantis and Hoopes

HONORS AND AWARDS

Schussel Family Professor of Management Science	2020
Mitsubishi Career Development Professorship	2019
Albert and Jeanne Clear Career Development Professorship	2015
Jay W. Forrester award for best system dynamics publication during previous five years	2015 2013, 2015
Academy of Management Best Paper Proceedings Selection	2011
CIDER Teacher of the Week, Virginia Tech, VA	2005
IATC "Bridges of Hope" award and scholarship	
Dana Meadows Award for best student paper in International System Dynamics conference	2004

- Dana Meadows Award for best student paper in International System Dynamics conference 2001
- Best paper award - National Industrial Engineering Conference - Tehran 1999
- Gold Medal- International Chemistry Olympiad - Moscow 1996

PROFESSIONAL SOCIETY MEMBERSHIP AND SERVICE

Grant reviewer for the National Science Foundation, the National Institutes of Health, and multiple international agencies. 2006-

Managing Editor for System Dynamics Review 2021-
Associate Editor for System Dynamics Review 2012-
Associate Editor for Management Science 2020-

Ad hoc referee for Management Science, Organization Science, Operations Research, Strategic Management Journal, *Proceedings of National Academy of Sciences,* Operations Management, Strategy Science, Journal of Product Innovation Management, Journal of Operations Management, Production and Operations Management, *Scientific Reports*, European Journal of Operational Research, Journal of Business Research, International Journal of Production Research, Risk Analysis, System Dynamics Review, Industrial and Corporate Change, International Journal of Production Economics, Journal of Obesity, Vaccine, Health Services Research, Decision Support Systems, Health Education and Behavior, Health Systems, Epidemiology and Infection, American Journal of Clinical Nutrition, Journal of Artificial General Intelligence, Research in Human Development, Transactions on Modeling and Computer Simulation, Computational and Mathematical Organization Theory, *Computational Biotechnology Journal* and multiple conferences 2002-

Conference Organizer, Theoretical Organization Models *2016-*

Workshop Organizer, International System Dynamics Conference *2002-*

Coordinator, MIT-U Albany System Dynamics Ph.D. Colloquium *2001-2006*

Member of INFORMS, System Dynamics Society, Institute of Industrial Engineers, Academy of Management, Strategic Management Society *2000-*

SOFTWARE AND MANAGEMENT FLIGHT SIMULATORS

- COVID-19 Projection Simulator
- Software Management Simulator
- Service Management simulator
- Human growth and body weight simulator
- Basal Metabolic Rate estimator
- Epidemics simulator