Navid Ghaffarzadegan

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ACADEMIC APPOINTMENT

- Associate Professor, Industrial and Systems Engineering, Virginia Tech, 2018 – present
- Assistant Professor, Industrial and Systems Engineering, Virginia Tech, 2013 – 2018
  - Director of the Social Dynamics and Analytics Lab

EDUCATION

- Postdoc — Engineering Systems Division, MIT, 2013
- Ph.D. — Public Policy, State University of New York at Albany, 2011
  - Dissertation: "Essays on Applications of Behavioral Decision Making in Public Management and Policy;" Winner of four dissertation awards. Dissertation Advisor: Professor David. F. Andersen
- M.B.A — Management, Sharif University of Technology, 2005
- B.S. — Mechanical Engineering, Sharif University of Technology, 2001

GRANTS *(Total: $10,611,769; Direct share: $1,241,275)*

- How Funding Facilitates Interdisciplinary Research for Early Career Scientists: Evidence from Neuroscience Research Sponsor: NSF. $30,000. Role: PI (Collaboration with Dr. Ran Xu, postdoc at ISE). January 2019 - March 2020.
- Cognitive Barriers to Understanding Complexity in Human-Technical Systems: Evidence from Engineering Students and Practitioners. Sponsor: NSF. $403,178. PI: Triantis (Virginia Tech). Role: Co-PI. Share: $80,635. September 2018- August 2021.
- Shaping health research workforce for tomorrow: Understanding career paths and productivity of early career health-policy researchers. Sponsor: Scholars program, Virginia Tech, ISCE. $30,000. Role: PI. June 2017- May 2018.
- Productivity Data Analysis for Science Workforce Modeling (Supplemental Grant 2U01GM094141-05). Sponsor: NIH. $357,998. PI: Hawley (Ohio State University). Role: Co-I. Share: $182,914. June 2016- May 2018.
- System Dynamics Modeling of Market Growth for the SupportAssist Program at Dell. Sponsor: Dell, Inc. $240,284. Role: PI. January 2016 - December 2017.
- A Model-Based Examination of Behavioral & Social Science Workforce: Improving Health Outcomes (Grant 2U01GM094141-05). Sponsor: NIH. $1,562,123. PI: Hawley (Ohio State University). Role: Co-I. Share: $543,083. February 2015- January 2019.
- System Dynamics Modeling for Understanding Complexities of Post-Traumatic Stress. Sponsor: MIT. $7,988,186. PI: Dr. Thomas Kochan (MIT). Role: Co-I. Share: $134,359. January 2014- September 2015.

AWARDS

- Outstanding Graduate Instructor Award (Selected by students to recognize excellence in graduate education), Industrial and Systems Engineering, Virginia Tech. 2021.
- Excellence Award for Outstanding New Assistant Professor, College of Engineering, Virginia Tech. 2016
- Lupina Young Researchers Award in Health System Dynamics for the paper "Beyond Personality Traits and Financial Incentives: Bias and Variation in Medical Practices as Results of Experiential Learning" ($2,500). 2011

- Dana Meadows Student Paper Award, 29th Int'l System Dynamics Conference for "Beyond Personality Traits and Financial Incentives: Bias and Variation in Medical Practices as Results of Experiential Learning" ($1,200). 2011
- System Dynamics Society tuition and stipend scholarship. 2006-2011
- Barry Richmond Scholarship Award, 26th Int'l System Dynamics Conference for the paper "Effect of Conditional Feedback on Learning" ($1,000). 2008
- Honorable Mention in Dana Meadows Student Paper Award, 26th International System Dynamics Conference for the paper "Effect of Conditional Feedback on Learning." 2008

RESEARCH

- ***Research interest***
  - Systems thinking, system dynamics, policy modeling, education policy, science policy.

- ***Book Chapters***

1) Ghaffarzadegan, N., Larson, R. C., Fingerhut, H. A., Jalali, M. S., Ebrahimvandi, A., Quaadgras, A., & Kochan, T. 2017. Model-Based Policy Analysis to Mitigate Post-Traumatic Stress Disorder. In: J.R. Gil-Garcia, T.A. Pardo, and L.F. Luna Reyes ed. Policy Analytics, Modelling, and Informatics: Innovative Tools for Solving Complex Social Problems. pp. 387-406. Springer.
2) Ghaffarzadegan, N., Lyneis, J., Richardson, G.P. 2015. Policy Informatics with Small System Dynamics Models: How Small Models Can Help the Public Policy Process, In: E. Johnston, ed. Governance in the Information Era: Theory and Practice of Policy Informatics. Routledge Press.

- ***Journal Publications***

1) Ghaffarzadegan N. 2021 Simulation-based what-if analysis for controlling the spread of Covid-19 in universities. PLoS ONE 16(2): e0246323.
   Media Coverage:
   i. Virginia Tech Daily: COVID-19 simulation model creates scenarios https://vtnews.vt.edu/articles/2021/02/unirel-covid-simulation-model.html
2) Ghaffarzadegan, N., Childs, L.M., Täuber, U.C. 2021. Diverse computer simulation models provide unified lessons on university operation during a pandemic. *BioScience* 71(2):113-114.
   Media Coverage:
   i. Virginia Public Radio: Large Covid Outbreaks "Very Likely" On College Campuses, Unless.... https://www.wvtf.org/post/large-covid-outbreaks-very-likely-college-campuses-unless
3) Xu, R., Baghaei Lakeh, A., & Ghaffarzadegan, N. 2021. Examining the characteristics of impactful research topics: A case of three decades of HIV-AIDS research. *Journal of Informetrics 15*(1). 101122.
4) 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.
   Media Coverage:
   i. BBC: Coronavirus: Are the bodies of victims undermining Iran's official figures?
   ii. Le Mond: A l'échelle mondiale, le Covid-19 tue davantage que ce que disent les bilans
5) Davis, K., Ghaffarzadegan, N., Grohs, J., Grote, D., Hosseinichimeh, N., Knight, D., Mahmoudi, H., & Triantis, K. 2020. The Lake Urmia vignette: a tool to assess

understanding of complexity in socio-environmental systems. *System Dynamics Review* 36(2), 191-222.

6) Guevara, J., Garvin, M. J., & Ghaffarzadegan, N. 2020. The Forest and the Trees: A Systems Map of Governance Interdependencies in the Shaping Phase of Road Public–Private Partnerships. *Journal of Management in Engineering* 36(1).
7) Ghaffarzadegan, N., Xu, R. 2018. Late Retirement, Early Careers, and the Aging of U.S. Science and Engineering Professors. *PLOS ONE* 13(12): e0208411.
    Media Coverage:
        i. Times Higher Education: Job challenges for young scientists tied to retirement age shift
8) Ghaffarzadegan, N., Xu, R., Larson, R.C., Hawley, J. 2018. Symptoms versus Root Causes: A Needed Structural Shift in Academia to Help Early Careers. *BioScience* 68(10): 744-745.
9) Xu, R., Ghaffarzadegan, N. 2018. Neuroscience bridging scientific disciplines in health: who builds the bridge, who pays for it? *Scientometrics* 117(2): 1183–1204.
10) Andalib, M.A., Ghaffarzadegan, N., Larson, R.C. 2018. The Postdoc Queue: A Labor Force in Waiting. *Systems Research and Behavioral Science* 35(6): 675-686.
11) Ghaffarzadegan, N., Larson, R.C. 2018. SD meets OR: A new synergy to address policy problems. *System Dynamics Review* 34(1-2): 327-353.
12) Ghaffarzadegan, N., Rad, A., Xu, R., Middlebrooks, S., Mostafavi, S., Shepherd, M., Chambers, L., Boyum, T. 2017. Dell's SupportAssist Customer Adoption Model: Enhancing the Next Generation of Data-Intensive Support Services. *System Dynamics Review* 33(3-4): 219-253.
13) Baghaei Lakeh. A, Ghaffarzadegan, N. 2017. Global Trends and Regional Variations in Studies of HIV/AIDS. *Scientific reports* 7: 4170.
14) Ghaffarzadegan, N., Xue, Y., Larson, RC. 2017. Work-Education Mismatch: An Endogenous Theory of Professionalization. *European Journal of Operational Research* 261(3): 1085–1097.
15) Hur, H., Andalib, M., Maurer, J., Hawley, J., Ghaffarzadegan, N., 2017. Recent Trends in Behavioral and Social Sciences Research (BSSR) Workforce in the U.S. *PLoS ONE*. 12(2): e0170887.
16) Ghaffarzadegan, N., Hawley, J., Larson, R.C. 2017. Education as a Complex System, *Systems Research and Behavioral Science* 34(3): 211-215.
17) Guevara, J.A., Garvin, M., and Ghaffarzadegan, N. 2017. The Capability Trap of the US Highway System: Policy and Management Implications. *Journal of Management in Engineering* 33(4).
18) Baghaei Lakeh, A., Ghaffarzadegan, N. 2016. The Dual-Process Theory and Understanding of Stocks and Flows. *System Dynamics Review* 32(3-4): 309-331.
19) Ghaffarzadegan, N., Ebrahimvandi, A., and Jalali, M. 2016. A Dynamic Model of Post-Traumatic Stress Disorder for Military Personnel and Veterans. *PLoS ONE* 11(10), e0161405.
    Media Coverage:
        i. Newsweek: PTSD Likely to Remain a Casualty of War for Veterans, Active Military
        ii. Business Insider: Study estimates the number of PTSD cases among military veterans in 10 years.

20) Azadeh-Fard, N., Ghaffarzadegan, N., and Camelio, J., 2016. Can a patient's in-hospital length of stay and mortality be explained by early-risk assessments? *PLoS ONE* 11(9), e0162976.

21) Baghaei Lakeh, A., Ghaffarzadegan, N. 2015. Does Analytical Thinking Improve Understanding of Accumulation? *System Dynamics Review* 31(2): 46–65.
22) Ghaffarzadegan, N., Larson, R.C. 2015. Posttraumatic Stress Disorder: Five Vicious Cycles that Inhibit Effective Treatment, *The Army Medical Department Journal* (October-December): 8-13.
23) Richardson, G.P., Black, L.J., Deegan, M., Ghaffarzadegan, N., Greer, D., Kim, H., Luna-Reyes, L.F., MacDonald, R., Rich, E., Stave, K.A., Zimmermann, N., Andersen, D.F. 2015. Reflections on Peer Mentoring for Ongoing Professional Development in System Dynamics. *System Dynamics Review* 31(3): 173-181.
24) Hur, H., Ghaffarzadegan, N., Hawley, J. 2015. Effects of Government Spending on Research Workforce Development: Evidence from Biomedical Postdoctoral Researchers, *PLoS ONE* 10(5): e0124928.
25) Ghaffarzadegan, N., Hawley, J., Larson, R.C., Xue, Y. 2015. A Note on PhD Population Growth in Biomedical Sciences, *Systems Research and Behavioral Science* 32(3): 402–405.
26) Larson, RC, Ghaffarzadegan, N., Xue, Y. 2014. Too Many PhD Graduates or Too Few Academic Job Openings: The Concept of R0 in Academia. *Systems Research and Behavioral Science* 31(6): 745–775.
    Media Coverage:
    i. New York Times: So Many Research Scientists, So Few Openings as Professors
    ii. Discover magazine: Does Science Produce Too Many PhD Graduates?
    iii. Cosmos magazine: Are there too many science PhDs or too few jobs?

27) Ghaffarzadegan, N., Hawley, J., Desai, A. 2014. Research Workforce Diversity: The Case of Balancing National vs. International Postdocs in U.S. Biomedical Research. *Systems Research and Behavioral Science* 31(2): 301-315.
28) Ghaffarzadegan, N., Epstein, AJ, Martin, EG. 2013. Practice Variation, Bias, and Experiential Learning in Cesarean Delivery: A Data-Based System Dynamics Approach. *Health Services Research* 48: 713–734.
29) Rouwette, E. A., & Ghaffarzadegan N. 2013. The system dynamics case repository project. *System Dynamics Review* 29(1): 56–60.
30) Larson, R.C., Ghaffarzadegan, N., Gomez Diaz, M. 2012. Magnified Effects of Changes in NIH Research Funding Levels. *Service Science* 4(4): 382-395.
    Media Coverage:
    i. NPR blog: After The NIH Funding 'Euphoria' Comes The 'Hangover'

31) Ghaffarzadegan, N., Andersen, DF. 2012. Modeling Behavioral and Dynamic Complexities of Warning Issuance for Domestic Security. *International Public Management Journal* 15(3): 337-363.
32) Ghaffarzadegan, N., Stewart, TR. 2011. An extension to the constructivist coding hypothesis as a learning model for selective feedback when the base rate is high. *Journal of Experimental Psychology: Learning, Memory & Cognition* 37(4): 1044-1047.
33) Ghaffarzadegan, N., Lyneis, J., Richardson, G.P. 2011. How Small System Dynamics Models Can Help the Public Policy Process. *System Dynamics Review 27*(1): 22-44.
    Reprinted:
    Ghaffarzadegan, N., Lyneis, J., Richardson, G.P. 2015. Policy Informatics with Small System Dynamics Models: How Small Models Can Help the Public Policy Process In: E. Johnston, ed. Governance in the Information Era: Theory and Practice of Policy Informatics. Routledge Press.

34) Ghaffarzadegan, N. and Tajrishi, AT. 2010. Economic transition management in a commodity market: the case of the Iranian cement industry. *System Dynamics Review 26*(2): 139–161.
35) Ghaffarzadegan, N. 2008. How a System Backfires: Dynamics of Redundancy Problems in Security. *Risk Analysis* 28(6): 1669-1687.

TEACHING

- ***Teaching interest***
  - Systems thinking, system dynamics, policy modeling and simulation.

- ***Sample of Courses***
  - Virginia Tech:
    - ISE 4984/ ISE 4804, System Dynamics Modeling of Industrial Systems, 3 Credits:
      - Fall 2019 (9 Enrolled, 5.3/6 Evaluation, 100% Response Rate)
      - Spring 2017 (17 Enrolled, 5.8/6 Evaluation, 82% Response Rate)
      - Spring 2016 (15 Enrolled, 5.7/6 Evaluation, 87% Response Rate)
    - ENGR 5104/ ISE 5814, System Dynamics Modeling of Socio-Technical Systems, 3 Credits:
      - Spring 2021 (14 Enrolled, 5.8/6 Evaluation, 93% Response Rate)
      - Spring 2020 (28 Enrolled, 5.2/6 Evaluation, 93% Response Rate)
      - Fall 2018 (10 Enrolled, 5.5/6 Evaluation, 100% Response Rate)
      - Spring 2018 (41 Enrolled, 5.8/6 Evaluation, 93% Response Rate)
      - Fall 2016 (25 Enrolled, 5.6/6 Evaluation, 81% Response Rate)
      - Fall 2015 (25 Enrolled, 5.6/6 Evaluation,68% Response Rate)
    - ISE 5015, Management of Change, Innovation, and Performance in Organizational Systems I, 3 Credits:
      - Fall 2018 (10 Enrolled, 5.9/6 Evaluation, 90% Response Rate)
      - Fall 2014 (19 Enrolled, 5.8/6 Evaluation, 74% Response Rate)
      - Fall 2013 (9 Enrolled, 5.3/6 Evaluation, 100% Response Rate)
    - ISE 4304, Global Issues in Industrial Management, 3 Credits:
      - Spring 2021 (98 Enrolled, 5.7/6 Evaluation, 69% Response Rate)

  - Other institutions:
    - Methodological Tools for Policy Analysis, SUNY Albany, 3 Credits, S2010.
    - Several week-long or day-long courses on systems thinking for researchers and practitioners of different institutions such as the National Institutes of Health, MIT Engineering Systems Division, and the Reproductive Health Supplies Coalition.

ADVISING

- ***Completed theses, dissertations, and undergraduate research projects***
  Advisor for completed PhD (4):
  - Nastaran Khalili, ISE, 2021. Dissertation: Three Essays on Utilizing Data Analytics and Dynamic Modeling to Inform Science and Innovation Policies.
    - Current position: Research Fellow, Food and Drug Administration, US.
  - Arash Baghaei Lakeh, ISE, 2018. Dissertation: Three Essays on Utilizing Data Analytics and Dynamic Modeling to Inform Science and Innovation Policies.
    - Current position: Research Scientist, University College London, UK.

- Maryam A. Andalib, ISE, 2018. Dissertation: Model-Based Analysis of Diversity in Higher Education.
  - Current position: Data Scientist, Ford.
- Nasibeh Azadeh-Fard (Co-Chair with Dr. Camelio), ISE, 2015. Dissertation: Essays on Risk Indicators and Assessment: Theoretical, Empirical and Engineering Approaches.
  - Current position: Assistant Professor, ISE, Rochester Institute of Technology.

Past M.S. RAs (2)

- Sarah Mostafavi, ISE, (2018). Current position: Data Scientist, Dell, Inc.
- Suresh Malhorta, ISE (2016). Current position: Business Analyst, Amazon.

- ***Postdoctoral Fellow Training***
  - Ran Xu, PhD, Employed: January 2017 – May 2019
    - Current position: Assistant Professor, Department of Allied Health Sciences, University of Connecticut.

- ***Special achievements of students***
  - Sarah Mostafavi, Masters Student of the Year, 2017-2018, Virginia Tech, ISE.
  - Andrew Thomas, Best Undergrad tare Research Project for "*Text Mining, and Data Analysis of Google Scholar*". 2018, Virginia Tech, ISE.
  - Dana Meadows Award for the Best Student Paper, Arash Baghaei Lakeh, "*The Dual-Process Theory and Understanding of Stocks and Flows*," System Dynamics Conference, 2017, Cambridge, MA.
  - Finalist for Best Student Paper award for Nasibeh Azadeh-Fard, "*Can Objective Early Warning Scores and Subjective Risk Assessments Predict Patient's Hospital Length of Stay and Mortality?*" INFORMS, Service Science Chapter, 2015, Philadelphia, PA.
  - Honorable mention for the Dana Meadows Best Student Paper award for Arash Baghaei Lakeh, "*Does Analytical Thinking Improve Understanding of Accumulation?*", System Dynamics Conference, 2015, Cambridge, MA.

ACADEMIC & EXECUTIVE SERVICES

- Associate Editor: System Dynamics Review (2016 – now)
  - Selected as the 2020 associate editor/reviewer of the year.
- Publication Committee Member in System Dynamics Society (2019 – now)
- Policy Thread Co-chair in System Dynamics Conference (2018 – 2020)
- Health Special Interest Group co-chair in System Dynamics Society (2020 – now)
- INFORMS Membership Committee (2020 – now)
- Journal Review
  - Proceedings of the National Academy of Sciences, Organization Science, System Dynamics Review, Systems Research and Behavioral Science, Systems, Risk Analysis Journal, European Journal of Operational Research (EJOR), Journal of Operational Research Society (JORS), Journal of Public Administration Research and Theory (JPART), Journal of Policy Analysis and Management (JPAM), International Public Management Journal, Science and Public Policy Journal, and others.
- Membership in Professional Societies
  - Institute for Operations Research and the Management Sciences (INFORMS), System Dynamics Society, Association for Public Policy Analysis and Management, and Society of Judgment and Decision Making.
- Major university services
  - University level

- Co-chair of Sesquicentennial Academic Working Group (2019-now)
- Member of Covid-19 Modeling for Virginia Tech Taskforce (2020-now)
- Member of the stakeholder committee for Virginia Tech's Strategic Growth Area (SGA) on Policy (provost-supported initiative, 2016-2019)
  - Co-chair of curriculum sub-committee of Policy SGA

▪ Department level
- Member of Graduate Admission Committee, Virginia Tech, ISE (2020-now)
- Member of Graduate Policy Council, Virginia Tech, ISE (2014-2020)
- Member of Strategic Planning Committee, Virginia Tech, ISE (2016-2020)
  - Chair of the committee since Fall 2019.

INVITED TALKS

- Council of Engineering Systems Universities, CESUN (2021), System Dynamics Society (2020), University of Liverpool (2020), Virginia Tech, Physics Department (2020), University of Arizona, Department of Systems and Industrial Engineering (2020), Sharif University of Technology, Department of Industrial Engineering (2020), AcademyHealth Invited Panel (2015), Systems Dynamics Society, PhD colloquium (2014), MIT, Sociotechnical Systems Research Center (2014), AcademyHealth Invited Panel (2014), Battelle Center for Science & Technology Policy, Ohio State University (2013); Hematology Workforce Working Group, NIH Heart, Lung and Blood Institute (2013); Heart Division; NIH Heart, Lung and Blood Institute (2013); Office of Behavioral and Social Sciences Research; National Institutes of Health (2013); Virginia Tech, Department of Industrial and Systems Engineering (2013); MIT, Sloan School of Management (2013); Yale School of Public Health (2012); George Washington University (2013); John Glenn School of Public Affairs, The Ohio State University (2012); MIT, SENSEable City Lab (2012); Albany Medical Hospital (2011).

REFERENCES

- Professor David F. Andersen
  Distinguished Service Professor of Public Administration and Information Science; Rockefeller College of Public Affairs; University at Albany (SUNY); david.andersen@albany.edu; 518-442-5258

- Professor Richard C. Larson
  Mitsui Professor of Engineering Systems; Engineering Systems Division; Massachusetts Institute of Technology (MIT); rclarson@mit.edu; 617-253-3604

- Professor G. Don Taylor
  Vice Provost; Professor; Department of Industrial and Systems Engineering; Virginia Tech; don.taylor@vt.edu; 540-231-6656

- Professor Eileen Van Aken
  Department head; Professor; Department of Industrial and Systems Engineering; Virginia Tech; evanaken@vt.edu; 540-231-6656