Matthew A. Turner, PhD

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Current position

2024-2025 Lecturer, Department of Environmental Social Sciences, Stanford Doerr School of Sustainability, *Stanford University*. Developing new courses for the department on quantitative social science for sustainability.

Education and Training

2021-2024 Postdoctoral scholar, Dept. of Env. Social Sciences, *Stanford University*

2021 PhD, Cognitive and Information Sciences, *University of California, Merced*. Chair: Paul E. Smaldino.

2012 MS, Applied Physics, *Rice University*

2008 BS, Mathematics, Physics *Syracuse University*

Teaching

Spring '26 *Opinion Change Modeling and Measurement*. **Dept. of Environmental Social Sciences, Stanford University.** Developed from scratch to introduce social influence theories and models that can be used to predict opinion change over time or to rigorously fit statistical models to empirical data. [link]

Spring '25 *Agent-based Modeling (for Sustainability)*. **Dept. of Environmental Social Sciences, Stanford University.** Developed from scratch to introduce students to the computational technique of agent-based modeling, used extensively in models of social behavior for promoting sustainable practices and behavior. [link]

Winter '25 *Computational Social Science for Sustainability*. **Dept. of Environmental Social Sciences, Stanford University.** Developed from scratch to introduce quantitative social science theories and models. To support this, I created a novel framework that consolidates diverse social science approaches with the purpose of providing a social science toolkit to help promote the diffusion of sustainable practices and behaviors. [link]

1. Other instructional service

   - Led ten-week agent-based modeling workshop and introduction to the Julia programming language for Prof. Jamie Jones' lab group and associates, Spring 2022

- Invited by Prof. Heather Bortfeld's lab (UC Merced Psychology) to give workshop on cultural evolution, agent-based modeling, and open science best-practices, Spring 2021

- Led hands-on workshop in Prof. Smaldino's lab group on how to use the on-campus supercomputing cluster at UC Merced, Spring 2020

- TA/Computing lab instructor, Introduction to Artificial Intelligence, Prof. David Noelle, Fall 2017, 2018, & 2019

- TA/Computing lab instructor and guest lecturer, Modeling Social Systems, Prof. Paul Smaldino, Spring 2019

- TA, Contemporary Moral Problems, Prof. David Jennings, Spring 2018

- TA, Introduction to Ethics, Prof. David Jennings, Spring 2017

- TA, Introduction to Cognitive Science, Prof. Rick Dale, Fall 2016

2. Mentorship

- Mentored a team of graduate student co-authors developing the paper, "Minority-group incubators and majority-group reservoirs support the diffusion of climate change adaptations," (2023) in *Phil. Trans. B* (see the publication).

- Mentored and supervised several UC Merced students during my dissertation work who contributed to Metacorps, the web application I developed for annotating metaphor found on cable news. Students were Gloria Quintana, Amy Tang, Sebastian Lavenant, Isabella Methot, Danny Zamora, and Conor Aaron.

- Mentored several graduate student programmers as part of the Virtual Watershed project with the Northwest Knowledge Network.

- Mentored and supervised undergraduate Joy Dai on a signal processing project using MATLAB for one semester of research at Rice University, 2011.

Professional Experience

2014-2016 Research Software Developer II, *Northwest Knowledge Network, University of Idaho*, Moscow, ID, USA. Led development of the "Virtual Watershed" modeling and data analysis & management system and associated tools (see Volk & Turner, 2019, and Gregory, et al., 2020, listed below). Integrated contributions of faculty, graduate students, and other professional software developers.

2012-2014 Data Engineer, *Economic Modeling Specialists Int'l*, Moscow, ID, USA. Ported legacy PHP code and SQL queries for large-scale economic data processing and forecasting to the D programming language. Developed novel approaches and applied best-practices to large-scale economic forecasts.

Grants, honors and awards

2023 Cognitive Science Society Conference Diversity & Social Inequality Award [link]
2022-2024 Pandemic Preparedness Hub Postdoctoral Fellowship [link]
2020-2021 NSF Research Training (NRT) Program in Intelligent Adaptive Systems [link]
2015 Research Data Alliance Early Career Fellow [link]
2010-2012 NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellow
2008 NSF International Research Experience for Students (IRES) at Universidade Federal de Santa Catarina, Santa Catarina, Brazil sub

Research products

1. Publications

Turner MA (2025). Computational Social Science for Sustainability. Tutorial presented at the *11th International Conference on Computational Social Science* in Norrkörping, Sweden. [link]

Sutton A, Reynolds AZ, **Turner MA**, & Jones JH (2025). Social influencers reduce infection burden and modify epidemic lag in group-structured populations. *Under review*. [link]

Dayer A, Aswamenakul C, **Turner MA**, Nicolay S, Wang E, Shurik K, & Holbrook C (2024). Intuitive moral bias favors the religiously faithful. *Scientific Reports*, 1–7. [link]

Turner MA, Singleton AL, Harris MJ, Augusto Lopez C, Harryman I, Arthur RF, Muraida C, Jones JH (2023). Minority-group incubators and majority-group reservoirs support the diffusion of climate change adaptations. *Philosophical Transactions of the Royal Society: Part B.* Theme: "Climate change adaptation needs a science of culture". [link]

Turner MA, Moya C, Smaldino PE, & Jones JH (2023). The Form of Uncertainty Affects Selection for Social Learning. *Human Evolutionary Sciences*. [link]

Turner MA, Moya C, Smaldino PE, & Jones JH (2022). Some forms of uncertainty may suppress the evolution of social learning. *Proceedings of the 44th Annual Conference of the Cognitive Science Society*. [link]

Turner MA & Smaldino PE. (2022). Mechanistic Modeling for the Masses - commentary on Yarkoni, "The generalizability crisis." *Behavioral and Brain Sciences*. [link]

Smaldino PE & **Turner MA** (2021). Covert signaling is an adaptive communication strategy in diverse populations. *Psychological Review.* [link]

Turner MA & Smaldino PE (2020). Stubborn Extremism as a Potential Pathway to Group Polarization. *Proceedings of the 42nd Annual Conference of the Cognitive Science Society*. [link]

Gregory A, …, **Turner MA** (2020). Efficient Model-data Integration for Flexible Modeling, Parameter Analysis & Visualization, and Data Management. *Frontiers in Water*. [link]

Smaldino PE, **Turner MA**, Contreras Kallens PA (2019). Open Science and Modified Funding Lotteries Can Impede the Natural Selection of Bad Science. *Royal Society Open Science*, 6(8), 191249. [link]

Volk JM & **Turner MA** (2019). PRMS-Python: A Python framework for programmatic PRMS modeling and access to its data structures. *Environmental Modelling and Software*, 114, 152–165. [link]

Turner MA & Smaldino PE (2018). Paths to Polarization: How Extreme Views, Miscommunication, and Random Chance Drive Opinion Dynamics. *Complexity*. [link]

Xu L, Davenport MA, **Turner MA**, Sun T, Kelly K (2011) Compressive Echelle Spectroscopy. *Proceedings of the SPIE – The International Society for Optical Engineering.*

Kanbur SM, Marconi M, Ngeow C, Musella I, **Turner MA**, et al. (2011) Period–colour and amplitude–colour relations in classical Cepheid variables – VI. New challenges for pulsation models. *Monthly Notices of the Royal Astronomical Society*, 408 (2), 695-700.

Kanbur SM, Marconi M, Ngeow C, Musella I, **Turner MA**, et al. (2009) Multiphase PC/PL Relations: Comparison Between Theory and Observations. AIP Conference Proceedings, Stellar Pulsations: Challenges for Theory and Observation, 1170 (September), 18-22.

Acevedo R, Lombardini R, **Turner MA**, Kinsey JL, Johnson BR (2008) Quantum and electromagnetic propagation with the conjugate symmetric Lanczos method. *Journal of Chemical Physics*, 128.

2. Software

Turner MA. `socmod`: tidy social behavior models in R. [link]

Turner MA. `MinMaj-Adaptation-Diffusion`: Social learning of adaptive behaviors in a metapopulation with a minority and majority group. [link]

Turner MA. `UncMod`: Model for analyzing social learning evolution in uncertain environments. [link]

Turner MA. `iatv`: Python API for interacting with the Internet Archive's TV News Archive. [link]

Turner MA & Volk JM. `PRMS-Python`: provides intuitive structures and functions for implementing and managing common modeling workflows with PRMS, the United States Geological Survery's hydrologic computer model. [link]

3. Patent

Kelly KF, Baraniuk RG, Woods G, Sun T, **Turner MA**. U.S. Patent No. 9,124,755. "Apparatus and method for compressive imaging and sensing through multiplexed modulation". September 1, 2015.

4. Dissertation and thesis

Turner MA (2021) *Four studies of communicative, cognitive, and social factors in extremism and polarization*. Doctoral dissertation. University of California, Merced, USA. [link]

Turner MA (2012) *Experimental and Numerical Investigations of Novel Architectures Applied to Compressive Imaging Systems*. Master's thesis. Rice University. Houston, Texas. [link]

5. Conference talks

Turner MA, Singleton AL, Harris MJ, Augusto Lopez C, Harryman I, Arthur RF, Muraida C, Jones JH (2023). Minority-group incubators and majority-group reservoirs for promoting the diffusion of climate change and public health adaptations. 45th Annual Meeting of the Cognitive Science Society. Sydney, New South Wales, Australia.

Turner MA, Singleton AL, Harris MJ, Augusto Lopez C, Harryman I, Arthur RF, Muraida C, Jones JH (2023). Minority-group incubators and majority-group reservoirs for promoting the diffusion of climate change and public health adaptations. American Association of Biological Anthropology Annual Meeting. Reno, Nevada, USA.

Turner MA Moya C, Smaldino PE, & Jones JH (2022, September). Some forms of uncertainty may suppress the evolution of social learning. 4th Cultural Evolution Society Conference. Aarhus University, Denmark.

Turner MA Moya C, Smaldino PE, & Jones JH (2022, July). Some forms of uncertainty may suppress the evolution of social learning. 44th Annual Meeting of the Cognitive Science Society. Toronto, Ontario, Canada.

Turner MA, (2022, July) Group polarization or simple consensus? A generative model that shows many group polarization detections are plausibly false positives. 8th International Conference on Computational Social Science. Poster. Chicago, USA.

Turner MA Moya C, Smaldino PE, & Jones JH (2022, September). How environmental uncertainty and correlated payoffs drive the evolution of social learning. American Association of Biological Anthropologists Conference 2022. Online.

Turner MA, (2021, February) Statistical Models of Group Polarization: Putting Theory into Practice. Society for Personality and Social Psychology. Poster. Online.

Turner MA, (2021, January) Social structure from repeated social interaction. Philosophy of Science Association. Poster. Online.

Turner MA & Smaldino PE, (2020, August) Group polarization via stubborn extremism. 42nd Annual Meeting of the Cognitive Science Society. Online. Paper. Video.

Turner MA & Smaldino PE, (2020, July) Group polarization via stubborn extremism. 6th International Conference on Computational Social Science. Online.

Kello C, **Turner MA**, Alviar C, (2019, August) A Statistical Model of Hierarchical Temporal Structure. The Guy Van Orden UConn Workshop on Cognition and Dynamics, XIV. Univeristy of Connecticut.

Turner MA, Bernacchi L, Maglio PP, Matlock T, (2018, December) How regulations strangle business: Lessons for science communication based on violence metaphors in the 2016 presidential election. eLightning talk at the American Geophysical Union meeting in Washington, D.C. [link]

Turner MA & Smaldino PE, (2018, October) Cultural polarization depends on whom we learn from and how well we communicate. Lightning talk during plenary session presented at the Cultural Evolution Society meeting in Tempe, Arizona.

Turner MA, Maglio PP, Matlock, T, (2017, July) A corpus analysis of the dynamics of violence metaphors in cable news programming on US politics. Talk presented at the 14th International Cognitive Linguistics Conference in Tartu, Estonia.

Turner MA, Bernacchi, L, Maglio, PP, Matlock, T, (2017, June) Breaking news: the EPA is strangling the economy! An analysis of metaphorical violence and US environmental regulators. Talk presented at the 2017 Conference on Communication and the Environment in Washington, DC.

Turner MA, Miller, SJ, Gregory, AE, Cadol, DD, Stone, MC, Sheneman, L, (2016, December). Coupled RipCAS-DFLOW (CoRD) Software and Data Management System for Reproducible Floodplain Vegetation Succession Modeling. Poster presented at the American Geophysical Society meeting in San Francisco, CA.

Turner MA, Koskela R, Vardigan M, Dubin D, Sheneman L. (2015, September). Linked Interdisciplinary Data Discovery. Poster presented at the 6th RDA Plenary

in Paris, France.

6.   White papers

Turner MA, Maglio PP, Matlock T. (2018) Metaphorical Violence in Political Discourse. [link]

Turner MA (2018) A neural network to classify metaphorical violence on cable news. [link]

Reviewer service

Psychological Review · *Journal of Matehematical Sociology* · *Evolutionary Human Sciences* · *Journal of Artificial Societies and Social Simulation* · *Cognitive Processing* · *Society for Personality and Social Psychology Annual Convention* · *Cognitive Systems Research*

Skills

Programming languages: Julia; Python; R; NetLogo; bash/shell scripting; HTML/CSS/JavaScript; Java; D; MATLAB; Mathematica; Scala; Clojure.

Technical proficiencies: Computational modeling, especially agent-based modeling; Cluster computing; Git & GitHub; Web servers; LaTeX; MongoDB, SQL, and other databases; REST APIs and API development.

Languages: English (native); Portuguese (fluent); Spanish and French (intermediate).