

Special Section on "Inverse Generative Social Science": Guest Editors' Statement

**Joshua M. Epstein¹, Ivan Garibay², Erez Hatna¹,
Matthew Koehler^{3,4}, William Rand⁵**

¹New York University, NYU School of Global Public Health, 708 Broadway, New York, NY 10003, United States

²University of Central Florida, Department of Industrial Engineering and Management Systems, 4000 Central Florida Blvd., PO Box 162993, Orlando, FL

³The MITRE Corporation, 7515 Colshire Dr, McLean, VA, United States

⁴Computational Social Science Society of the Americas

⁵NC State University, R. H. Smith School of Business, Nelson Hall, 2801 Founders Drive, Raleigh, NC, 27695, United States

Correspondence should be addressed to je65@nyu.edu

Journal of Artificial Societies and Social Simulation 26(2) 10, 2023

Doi: 10.18564/jasss.5085 Url: <http://jasss.soc.surrey.ac.uk/26/2/10.html>

Received: 17-03-2023

Accepted: 17-03-2023

Published: 31-03-2023

Abstract: This is a guest editors' statement accompanying the publication of a special issue on "Inverse Generative Social Science", published in volume 26, issue 2, 2023 of JASSS-Journal of Artificial Societies and Social Simulation"

Keywords: Inverse Generative Social Science, Agent-Based Models, Evolutionary Computation, Genetic Programming

● Statement

- 1.1** This Special Section of JASSS is a direct outgrowth of two International Workshops we co-organized in 2020 and 2021, and of the Special Panel on iGSS held in 2022 at the SCC Conference in Milan, Italy. The papers collected here were chosen by us from the Workshops and Panel, to highlight the power and breadth of the inverse generative method for developing—and particularly for *evolving*—explanatory agent-based models.
- 1.2** As was our intent, the range of application areas displayed in the collection is wide, including mixed segregation patterns (Gunaratne et al. 2023), flocking and opinion dynamics (Greig et al. 2023), common pool resource problems (Miranda et al. 2023), and alcohol consumption dynamics (Vu et al. 2023). In turn, the specific model targets, fitness metrics, agent primitives, their permitted combinations, as well as the specific evolutionary algorithms and stopping rules employed are also diverse.
- 1.3** There are many applications of Evolutionary Computation and Genetic Programming beyond the collection, including many in the private and government sectors, with objectives quite distinct from explanation. The present collection, however, is focused on the evolution of agents for the *generative explanation* of social and collective phenomena. The Special Section begins with an over-arching statement on iGSS by Joshua M. Epstein (Epstein 2023), which also introduces the other papers.
- 1.4** We hope this collection stimulates much more work in this promising field. For all the many papers delivered at the 2020 and 2021 Workshops and the 2022 Milan Panel, see <https://www.igss-workshop.org/schedule>, <https://www.igss-workshop.org/program>.
- 1.5** For their stimulating keynote addresses at the 2021 iGSS Workshop, we thank Scott Page (keynote address can be found here: <https://www.youtube.com/watch?v=DbahEg-uTB8>) and Matthew Jackson (keynote address can be found here: <https://www.youtube.com/watch?v=vtx1q0hIHvE>).

- 1.6** We especially thank JASSS Editor-in-Chief Flaminio Squazzoni for organizing the Social Simulation Conference 2022 in Milan (<https://ssc2022.behavelab.org/>), for suggesting its iGSS Panel, and for his support and encouragement throughout.
- 1.7** For their funding and facilities support, we thank MITRE, GMU, NYU, ESSA, Kenneth Judd, Defense Advanced Research Projects Agency (DARPA) under agreements HR00112290104 (PA-21-04-06) and HR001117S0018 (FA8650-18-C-7823).

References

- Epstein, J. M. (2023). Inverse generative social science: Backward to the future. *Journal of Artificial Societies and Social Simulation*, 26(2), 9
- Greig, R., Major, C., Pacholska, M., Bending, S. & Arranz, J. (2023). Learning interpretable logic for agent-based models from domain independent primitives. *Journal of Artificial Societies and Social Simulation*, 26(2), 12
- Gunaratne, C., Hatna, E., Epstein, J. M. & Garibay, I. (2023). Generating mixed patterns of residential segregation: An evolutionary approach. *Journal of Artificial Societies and Social Simulation*, 26(2), 7
- Miranda, L., Garibay, O. O. & Baggio, J. (2023). Evolutionary model discovery of human behavioral factors driving decision-making in irrigation experiments. *Journal of Artificial Societies and Social Simulation*, 26(2), 11
- Vu, T. M., Buckley, C., Duro, J. A., Brennan, A., Epstein, J. M. & Purshouse, R. C. (2023). Can social norms explain long-term trends in alcohol use? Insights from inverse generative social science. *Journal of Artificial Societies and Social Simulation*, 26(2), 4