

## References & Resources for BITyGraphS: *Building Integrated Theory for Graphs and Human Systems*

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### Graph Dynamical Systems

Abhijin Adiga, Chris Barrett, Stephen Eubank, Chris J. Kuhlman, Madhav V. Marathe, Henning S. Mortveit, S.S. Ravi, Daniel J. Rosenkrantz, Richard E. Stearns, Samarth Swarup, and Anil Vullikanti. Validating agent-based models of large networked systems. In Proceedings of the 2019 Winter Simulation Conference, 2019.

K. Atkins, C. Barrett, R. Beckman, K. Bisset, J. Chen, S. Eubank, A. Feng, X. Feng, S. Harris, B. Lewis, A. Kumar, M. Marathe, A. Marathe, H. Mortveit, and Stretz P. An interaction based composable architecture for building scalable models of large social, biological, information and technical systems. CT Watch, 4:46{53, 2008.

C. L. Barrett, K. Bisset, S. Eubank, V. S. A. Kumar, M. V. Marathe, and H. S. Mortveit. Modeling and Simulation of Large Biological, Information and Soci-Technical Systems: An Interaction-Based Approach, volume 64 of Proceedings of Symposia in Applied Mathematics, pages 101{148. American Mathematical Society, 2007.

C. L. Barrett, H. S. Mortveit, and C. M. Reidys. Elements of a theory of simulation II: Sequential dynamical systems. Applied Mathematics and Computation, 107(2{3):121{136, 2000.

C. L. Barrett, H. S. Mortveit, and C. M. Reidys. Elements of a theory of simulation III, equivalence of SDS. Applied Mathematics and Computation, 122:325{340, 2001.

C. L. Barrett, H. S. Mortveit, and C. M. Reidys. Elements of a theory of simulation IV: Fixed points, invertibility and equivalence. Applied Mathematics and Computation, 134:153{172, 2003.

EOF

C. L. Barrett and C. M. Reidys. Elements of a theory of simulation I: Sequential CA over random graphs. Applied Mathematics and Computation, 98(2{3):241{259, 1999.

Christopher Barrett, Keith Bisset, Shridhar Chandan, Jiangzhuo Chen, Youngyun Chungbaek, Stephen Eubank, Yaman Evrenosoglu, Bryan Lewis, Kristian Lum, Achla Marathe, Madhav Marathe, Henning Mortveit, Nidhi Parikh, Arun Phadke, Je\_ Reed, Caitlin Rivers, Sudip Saha, Paula Stretz, Samarth Swarup, James Thorp, Anil Vullikanti, and Dawen Xie. Planning and response in the aftermath of a large crisis: an agent-based informatics framework. In Proceedings of the 2013 Winter Simulation Conference, pages 1515{1526, 2013.

Christopher L. Barrett, Virgilio Centeno, Stephen G. Eubank, C.Y. Evrenosoglu, Achla Marathe, Madhav V. Marathe, C. Mishra, Henning S. Mortveit, Anamitra Pal, Arun Phadke, James Thorp, Vullikanti S. Anil Kumar, and Mina Youssef. Impact of a surface nuclear blast on the transient stability of the power system. In Proceedings of the 9th International Conference on Critical Information Infrastructures Security, pages 153{158. Springer International Publishing, 2014. Limassol, Cyprus, October 13-15.

Reinhard Laubenbacher, Abdul S. Jarrah, Henning S. Mortveit, and S.S. Ravi. A mathematical formalism for agent-based modeling. In *Encyclopedia of Complexity and System Science*, pages 88{104. Springer New York, 2009. Preprint at arXiv:0801.0249.

Matthew Macauley and Henning S. Mortveit. Cycle equivalence of graph dynamical systems. *Nonlinearity*, 22(2):421{436, 2009. math.DS/0709.0291.

M. Mitchell Waldrop. What if a nuke goes off in Washington, D.C.? Simulations of artificial societies help planners cope with the unthinkable. *Science*, April 2018.

## **Cognitive Architectures, Cognitive Modeling & Social Simulation**

Orr, M., Stocco, A., Lebiere, C. Morrison, D. (2021). Attitudinal polarization on social networks: A cognitive architecture perspective. In Stewart, T. C. (Ed.). *Proceedings of the 19th International Conference on Cognitive Modelling* (pp. tbd). University Park, PA: Applied Cognitive Science Lab, Penn State.

Morgan, J., Lebiere, C., Orr, M. (2021). Trusty ally or faithless snake: Modeling the Role of Human Memory and Expectations in Social Exchange. In *Proceedings of the International Conference SBP-BRiMS 2021*, Robert Thomson, Muhammad Hussain, Chris Dancy, and Aryn Pyke (Eds.) July 06-09, 2021, Virtual, Springer.

Bhattacharya, P., Lebiere, C., Swarup, S., Ekanayake, S., Kuhlman, C., Morrison, D., Wilson, M., Orr, M. G. (2019). The Matrix: An Agent-Based Modeling Framework for Data Intensive Simulations. *International Conference on Autonomous Agents and MultiAgent Systems 2019*. Montreal, Canada.

Afrasiabi, M., Orr, M. G., Austerweil, J. (2019). Evaluating Theories of Collaborative Cognition Using the Hawkes Process and a Large Naturalistic Data Set. *Proceedings of the 41st Annual Conference of the Cognitive Science Society* (pp. 69-75). Montreal, QB: Cognitive Science Society.

Orr, M. G., Lebiere, C., Stocco, A., Pirolli, P., Pires, B., Kennedy, W. G. (2019). Multi-Scale Resolution of Neural, Cognitive and Social Systems. *Computational and Mathematical Organization Theory*, 25, 4–23.

Romero, O., & Lebiere, C. (2014). Simulating Network Behavioral Dynamics by using a Multi-agent approach driven by ACT-R Cognitive Architecture. In *Proceedings of the Behavior Representation in Modeling and Simulation Conference (BRIMS-2014)*. Washington, DC, April 2014.

Juvina, I., Lebiere, C., & Gonzalez, C. (2015). Modeling trust dynamics in strategic interaction. *Journal of applied research in memory and cognition*. 4(3): 197-211.  
<http://dx.doi.org/10.1016/j.jarmac.2014.09.004>

Lebiere, C., Stocco, A., Reitter, D., & Juvina, I. (2010). Scaling up high-fidelity cognitive modeling to real-world applications. In *Proceedings of NATO Workshop on Human Modeling for Military Application* . Amsterdam, NL, October 18-20, 2010.

Reitter, D., Juvina, I., Stocco, A., & Lebiere, C. (2010) Resistance is futile: Winning lemonade market share through metacognitive reasoning in a three-agent cooperative game. In *Proceedings of the 19th Conference on Behavioral Representation in Modeling*

and Simulation (BRIMS). Charleston, S.C.

Reitter, D., & Lebiere, C. (2012). Social cognition: Memory decay and adaptive information filtering for robust information maintenance. In Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence (AAAI-12).

Reitter, D. & Lebiere, C. (2011). How groups develop a specialized domain vocabulary: A cognitive multi-agent model. *Journal of Cognitive Systems Research*, 12(2):175-185.

Reitter, D., & Lebiere, C. (2011). Towards cognitive models of communication and group intelligence. In Proceedings of the 33rd Annual Meeting of the Cognitive Science Society, pp. 734-739, Boston, MA.

Reitter, D., & Lebiere, C. (2010). On the influence of network structure on language evolution. In R. Sun, editor, Proceedings of Workshop on Cognitive Social Sciences: Grounding the Social Sciences in the Cognitive Sciences (at Cognitive Science: CogSci 2010), Portland, Oregon.

Reitter, D., & Lebiere, C. (2010). Accountable Modeling in ACT-UP, a Scalable, Rapid-Prototyping ACT-R Implementation. In Proceedings of the 2010 International Conference on Cognitive Modeling. Philadelphia, PA.

West, R. L., Lebiere, C. & Bothell, D. J. (2006). Cognitive architectures, game playing and human evolution. In Sun, R. (Ed) *Cognition and Multi-Agent Interaction: From Cognitive Modeling to Social Simulation*. NY, NY: Cambridge University Press. Pp. 103-121.

Whalen, A., & Griffiths, T. L. (2017). Adding population structure to models of language evolution by iterated learning. *Journal of Mathematical Psychology*.

Gonzalez, C., Ben-Asher, N., Martin, J. M., & Dutt, V. (2015). A cognitive model of dynamic cooperation with varied interdependency information. *Cognitive science*, 39(3), 457-495.

Graf, C., Degen, J., Hawkins, R. X. D. & Goodman N.D. Animal, dog, or dalmatian? Level of abstraction in nominal referring expressions. (2016). In Proceedings of the Thirty-Eighth Annual Conference of the Cognitive Science Society.

Greenwald, A., Littman, M. L., & Austerweil, J. L. (2016). Feature-based Joint Planning and Norm Learning in Collaborative Games. In Proceedings of the 38th Annual Meeting of the Cognitive Science Society.

Monroe, W., Hawkins, R. X. D., Goodman, N. D. & Potts, C. Colors in Context: A Pragmatic Neural Model for Grounded Language Understanding. (2017) Transactions of the Association for Computational Linguistics.

Zhang, Y., & Leezer, J. (2010). Simulated human-like decisions in a memory-based agent

model. *Computational and Mathematical Organization Theory*, 16, 373-399.

Bhattacharyya, S., & Ohlsson, S. (2010). Social creativity as a function of agent cognition and network properties: A computer model. *Social Networks*, 32(4), 263-278.

R. Sun (ed.), *Cognition and Multi-Agent Interaction: From Cognitive Modeling to Social Simulation*. Cambridge University Press, 2006.

R. Sun (ed.), [Grounding Social Sciences in Cognitive Sciences](#). MIT Press, Cambridge, MA. 2012.

Burkett, D., & Griffiths, T. L (2010). Iterated learning of multiple languages from multiple teachers. *Evolang* 8.

Shoda, Y., LeeTiernan, S., & Mischel, W. (2002). Personality as a dynamical system: Emergence of stability and distinctiveness from intra and interpersonal interactions. *Personality and Social Psychology Review*, 6(4), 316-325.

Van Overwalle, F., & Heylighen, F. (2006). Talking nets: A multiagent connectionist approach to communication and trust between individuals. *Psychological Review*, 113(3), 606.

## **Social Simulation**

Nidhi Parikh, Harshal G. Hayatnagarkar, Richard J. Beckman, Madhav V. Marathe, and Samarth Swarup (2016). A Comparison of Multiple Behavior Models in a Simulation of the Aftermath of an Improvised Nuclear Detonation. *Autonomous Agents and Multi-Agent Systems* 30(6), Special Issue on Autonomous Agents for Agent-Based Modeling, 1148--1174.

Bryan Lewis, Samarth Swarup, Keith Bisset, Stephen Eubank, Madhav Marathe, and Chris Barrett (2013). A Simulation Environment for the Dynamic Evaluation of Disaster Preparedness Policies and Interventions. *The Journal of Public Health Management and Practice* 19, S42-S48.

Christopher Barrett, Stephen Eubank, Achla Marathe, Madhav Marathe, and Samarth Swarup (2015). Synthetic Information Environments for Policy Informatics: A Distributed Cognition Perspective. In, Erik Johnston (Ed.), *Governance in the Information Era: Theory and Practice of Policy Informatics*, pp. 267—284, Routledge, New York, NY.

Madhav V. Marathe, Henning S. Mortveit, Nidhi Parikh, and Samarth Swarup (2014). Prescriptive Analytics Using Synthetic Information. In, William H. Hsu (Ed.), *Emerging Trends in Predictive Analytics: Risk Management and Decision Making*, IGI Global: Hershey, PA.

Christopher Barrett, Stephen Eubank, Achla Marathe, Madhav Marathe, Zhengzheng Pan, and Samarth Swarup (2011). Information Integration to Support Model-Based Policy Informatics, *The Innovation Journal* 16(1), Article 2.

Nidhi Parikh, Madhav V. Marathe, and Samarth Swarup (2016). Integrating Behavior and Microsimulation Models. In, Namazi-Rad, M.-R., Padgham, L., Perez, P., Nagel, K. & Bazzan, A. (Eds.), *Agent Based Modelling of Urban Systems: First International Workshop, ABMUS 2016, Held in Conjunction with AAMAS, Singapore, Singapore, May 10, 2016, Revised, Selected, and Invited Papers*, pp. 39-59, Springer International Pub.

Chris Kuhlman, Gaurav Tuli, S. S. Ravi, Samarth Swarup, Madhav Marathe (2013). Blocking Simple and Complex Contagion Spread by Edge Removal. In, *Proceedings of The IEEE International Conference on Data Mining (ICDM)*, Dallas, Texas, Dec 7-10.

Nidhi Parikh, Samarth Swarup, Paula Stretz, Caitlin Rivers, Bryan Lewis, Madhav Marathe, Stephen Eubank, Christopher Barrett, Kristian Lum, and Youngyun Chungbaek (May 2013). Modeling Human Behavior in the Aftermath of a Hypothetical Improvised Nuclear Detonation. In *Proceedings of the Twelfth International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, Saint Paul, MN, USA.

Shridhar Chandan, Sudip Saha, Christopher Barrett, Stephen Eubank, Achla Marathe, Madhav Marathe, Samarth Swarup and Anil Kumar S. Vullikanti (Apr 2013). Modeling the Interactions between Emergency Communications and Behavior in the Aftermath of a Disaster. In *Proceedings of the International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP)*, Washington DC, USA.

Nidhi Parikh, Mina Youssef, Samarth Swarup, Stephen Eubank, and Youngyun Chungbaek (2014). Cover Your Cough! Quantifying the Benefits of a Localized Healthy Behavior Intervention on Flu Epidemics in Washington DC. In *Proceedings of the International Conference on Social Computing, Behavioral-Cultural Modeling, and Prediction (SBP)*, Washington DC, USA.

Kuhlman, Chris J., V. S. Anil Kumar, Madhav V. Marathe, Henning S. Mortveit, Samarth Swarup, Gaurav Tuli, S. S. Ravi, and Daniel J. Rosenkrantz, "A General-Purpose Graph Dynamical System Modeling Framework," *Winter Simulation Conference (WSC)*, 2011.

Bisset, Keith, Jiangzhuo Chen, Chris J. Kuhlman, V. S. Anil Kumar, and Madhav V. Marathe, "Interaction-Based HPC Modeling of Social, Biological, and Economic Contagions Over Large Networks," *Invited paper, Winter Simulation Conference (WSC)*, 2011.

Kuhlman, Chris J., V. S. Anil Kumar, Madhav V. Marathe, S. S. Ravi, and Daniel J. Rosenkrantz, "Inhibiting Diffusion of Complex Contagions in Social Networks: Theoretical and Experimental Results," *Journal Data Mining and Knowledge Discovery*, 2015. PMID: PMC4350814

Korkmaz, Gizem, Chris J. Kuhlman, Achla Marathe, Madhav V. Marathe, Fernando Vega-Redondo, “Collective Action Through Common Knowledge Using A Facebook Model,” 13th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2014.

Kuhlman, Chris J., V. S. Anil Kumar, and S. S. Ravi, “Controlling Opinion Propagation in Online Networks,” Journal of Computer Networks, Vol. 57, pp. 2121-2132, 2013.

Kuhlman, Chris J., and Henning S. Mortveit, “Limit Sets of Generalized, Multi-Threshold Networks,” Journal of Cellular Automata (JCA), Volume 10, pp. 161-193, 2015. PMCID: PMC453256