Contact Information	Biocomplexity Institute University of Virginia https://abhijin.github.io	email: abhijin@virginia.edu phone: +1 540 204 6679	
Current Position	Research Associate Professor Biocomplexity Institute University of Virginia	2022 -	
Research interests and Focus	I develop computational frameworks to study complex systems that arise from large-scale interactions across domains such as infectious disease dynamics, socio- environmental resilience, agriculture, and social systems. My work draws on and contributes to network science, simulation modeling, algorithm design, and machine learning. Central to my research are the development of realistic synthetic datasets (like digital twins) and data-driven simulation models, the design of domain-informed algorithms, and the advancement of theoretical foundations underlying these complex systems. Much of my work takes place in interdisciplinary team environments and has been supported by multiple funding agencies.		
Work Experience	Research Assistant Professor2018 - 2022Network Systems Science and Advanced Computing (NSSAC)University of Virginia		
	Research Assistant Professor Senior Research Associate Postdoctoral Associate Network Dynamics and Simulation Science Laborator Biocomplexity Institute of Virginia Tech	Jul 2016 – Oct 2018 May 2014 – Jul 2016 October 2011 – May 2014 ry	
	Research Associate Dept. of Computer Science and Automation, IISc	March 2011 – September 2011	
	Beceem Communications Pvt Ltd Algorithm design for WiMax (802.16)	August 2004 – July 2006	
	Project Associate Project Associate Dept. of Electrical Engineering, IISc	October 2003 – April 2004 October 2000 – August 2001	
Education	PhD: Dept. of Computer Science and Automation Indian Institute of Science, Bangalore, India	August 2006 – March 2011	
	Master of Science (Engg): Dept. of Electrical Engineering, Indian Institute of Science, Bangalore, India	August 2001 – August 2003	

	Bachelor of Engineering:1990Bangalore University (B.M.S. College of Engineering)Telecommunication Engineering	6 - 2000
Grants	 USDA NIFA Foundational and Applied Science Program: Network M Food Systems and their Application to Invasive Species Spread, Amount: \$ Duration: Sep'19–Aug'23, Role: PI 	odels of 400,000;
	 USAID IPM Innovation Labs: Assessment of Invasive Alien Species Dist in the Chitwan-Annapurna-Landscape (CHAL) Region, Nepal, Amount: \$ Duration: Jan'19–Nov'21, Role: Co-PI 	<i>ribution</i> 150,000;
	 USAID Egypt Mission: Pest Risk Assessment of the Fall Armyworm, Spe frugiperda in Egypt, Amount: \$18,000; Duration: Oct'17–Dec'17, Role: Co 	odoptera o PI
	 USAID IPM Innovation Labs: A High-resolution Interaction Based App Modeling the Spread of Agricultural Invasive Species, Amount: \$1,000,000 (S for Virginia Tech); Duration: Oct'15–Nov'21, Role: PI 	roach to \$800,000
Awards	\circ IJCAI-22 Distinguished PC Member (top 3%).	
	• IJCAI-21 Distinguished SPC Member.	
	\circ "DSFEW Early Career Researchers Travel Fund", KDD 2016.	
	 "Honorable Mention For Outstanding Novelty of Research Question" award paper "Sensitivity of Diffusion Dynamics to Network Uncertainty" in AAA 	l for the AI'13.
	 Infosys Fellow: awarded to select PhD candidates in IISc by Infosys Tech Ltd. 	nologies
	 Secured All India Rank of 34 in GATE 2000 (EC), a national level entran- for post graduate studies. 	ce exam
	\circ Ranked 7th in Bangalore University in Telecommunication Engg. (Year 20	000).
IMPACT	 USAID and USDA invasive species projects featured in Agrilinks, Wisconsin Charlottesville News, Knowable Magazine, and Virginia Tech news. 	Farmer,
	• USAID project mentioned in the USAID Center for Emerging Threats of Notice of Funding Opportunity as a project that has informed the US of e threats and helped prepare for impending invasion.	of Crops merging
	 Supported BII's COVID-19 response efforts in (i) network construction, a and validation and (ii) simulation analytics. 	analysis,
	 Invited talks in Egypt and Indian Council of Agricultural Research, India. various conferences in national and international venues on invasive species m Ethiopia, India, International Congress of Entomology (Orlando), Sympo Integrated Pest Management (Washington DC). 	Talks in nodeling: sium on
	\circ Webinar: New Approaches to Control the South American Tomato Leaf Min $absoluta,$ April 2018	ner <i>Tuta</i>
Mentorship	$\circ~$ Co-advisor for two Masters student (Thesis accepted) and one PhD student	nt.
	$\circ~$ Part of thesis committee for four PhD students. I advised on several part thesis of two of them.	ts of the
	\circ Research assistants (PhD 1 and Masters students 4)	
	\circ Undergraduates: 9	
	◦ High-school: 3	

Professional Service	• Professional service:		
	• Grant review panel (NSF 1, USDA 5, FONDECYT Chile 1)		
	• Senior TPC (3) and TPC (10)		
	• Reviewed papers for a number of journals and conferences spanning multiple domains such as Nature comm. Bio., Journal of Pest Science, JPDC, ACM Trans. on Algo, Journal of Royal Soc. Interface, etc.		
	• Biocomplexity Institute:		
	• Student and postdoc hiring committee in NSSAC 2018–2020.		
	• Student and postdoc hiring committee in NDSSL 2017–2018.		
	• Member of graduate students admission team in NDSSL for the Fall'16 admissions		
Programmatic contributions	• I have led the development of a livestock digital twin/similar for addressing applica- tions related to public health and environmental safety.		
	• As PI and Co-PI of the USAID and USDA projects, I have led the research in the area of invasive species modeling. This includes collaborating with people from multiple domains and countries (France, Senegal, India, Nepal, Bangladesh, and US), presenting in annual meetings, data exploration, providing content for news reports, mentoring students, and preparing annual reports. It has resulted in publications in top venues including Proceedings of the Royal Society Biology, Journal of Pest Science, Journal of Crop Protection and IEEE BigData conference.		
	• COVID-19 response: I led the modeling and development of certain modules in the synthetic population generation pipeline. This work has contributed to the generation of US domestic networks as well as global networks. Also, I developed a network analysis tool set, which is used to validate our networks and for com- parative analysis. These tools have been applied (i) to provide weekly inputs to various agencies during certain periods of the year 2020-21, and (ii) in manuscripts submitted/under preparation.		
	• DARPA NGS2: I contributed significantly to the theoretical aspects of this project. Our work on inferring graphical dynamical systems has resulted in five publications in top AI venues and several workshop presentations.		
	• Fall armyworm in Egypt: In a collaborative effort, I led the modeling effort to assess the possible spread of Fall armyworm in Egypt. This was funded by USAID mission in Egypt.		
	$\circ~$ Participated in a number of proposal writing efforts every year.		
Software and Datasets	• Multi-pathway simulator: I have led the development of a simulation framework to study the multi-pathway spread of invasive species. It consists of a simulator of a generic network diffusion process implemented using vectorized methods in Python, a multi-scale temporal network module, implementation of algorithms for calibration and interventions, modules for model space exploration using computing clusters, regression tests, and various visualization tools. Domestic trade networks have been constructed for several countries using multiple datasets and expert knowledge. The resulting simulation framework has been applied in multiple studies. The simulator and synthetic datasets are publicly available and are constantly updated.		
	• High-resolution synthetic population models and datasets: Our group (NSSAC) has been synthesizing highly-detailed population models from multiple data sources for more than 15 years. Over the years, these datasets have been applied in epidemiology		

(COVID-19, Ebola, influenza, malaria, etc.), transportation, disaster preparedness, resilience and sustainability. I have played a prominent part in the Biocomplexity Institute's COVID-19 response on the modeling and development of the synthetic population networks. I co-led the design and implementation of the physical contact network construction module. I applied concepts from geometric intersection graphs and parallelization to speed up the network generation. I have also developed a tool for analyzing the generated networks. It has been regularly applied to compare different networks, visualize, and validate our models. This software has been well integrated in to our synthetic population pipeline.

- Deep learning and remote sensing: We have developed a convolutional neural network (CNN) framework to predict the distribution of invasive plants using multispectral satellite images and field survey data. Our robust training and evaluation framework employs multiple hold-out approach for model selection and transfer learning to cope with data challenges imposed by field survey and imagery constraints. Multi-spectral remote-sensed images from multiple satellites were used in this study. We have developed the framework for optical calibration, sharpening, and interpolation of the images towards feature vector extraction. Popular deep neural networks had to be adapted for satellite images. Transfer learning approaches were applied. The framework is applied to study the distribution of multiple invasive plants in the Chitwan-Annapurna Landscape of Nepal, a biodiversity hotspot.
- TRANSDISCIPLINARYMy work involves leading and being part of large teams of researchers from different
fields. As PI of two USAID and USDA projects, I have led BII's research in the area of
invasive species modeling. As PI, I have initiated multiple projects collaborating with
researchers from several countries (US, France, Senegal, India, Nepal, and Bangladesh).
Example projects include (i) modeling the spread of a pest of the tomato plant,
Tuta absoluta in Southeast Asia and West Africa involving entomologists, economists,
modelers and computer scientists and (ii) mapping invasive plants in Nepal using
remote-sensing and machine learning involving botanists and geoinformation specialists.
I play a major role is several large team projects in the Biocomplexity Institute as
well. These include studies related to computational epidemiology such as COVID-19
response, disaster preparedness, and computational social science.

TALKS

- 1. US-Scale High Resolution Digital Twin of Coupled Livestock, Wild Birds, and Human Populations Ecosystem, CDC (six presentations), September to December 2024.
- US-Scale High Resolution Digital Twin of Coupled Livestock, Wild Birds, and Human Populations Ecosystem, Spillover from Highly Pathogenic Avian Influenza, LANL, National Press Club, September 2024.
- 3. Identifying Complicated Contagion Scenarios from Cascade Data, 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, August 2023.
- 4. A Robust Deep Learning Framework Reveals the Spread of Multiple Invasive Plants in a Biodiversity Hotspot using Satellite Imagery, The Workshop on Artificial Intelligence for Social Good (in AAAI'23), February 2023.
- How to Stop an Epidemic? Network Dynamics and Simulation Systems, CheckedIt, India (virtual), February 2022.
- (Invited) Learning the Local and Global Behavior of Dynamical Systems on Networks, Workshop on AI Socio-écosysteme et résilience, Montpellier, France (virtual), November 2021.
- Boolean Games: Inferring Agents' Goals Using Taxation Queries, International Joint Conference on Artificial Intelligence (IJCAI'20) (virtual), January 2021.

- 8. A Deep Learning Framework for Invasive Species Mapping using High-Resolution Satellite Imagery, ASPRS 2020 Annual Conference (virtual), June 2020.
- 9. (**Invited**) Network Dynamical Systems: Theory and Applications, Indian Institute of Technology, Hyderabad, India, November 2019.
- Modern AI Techniques to Understand the Spatio-temporal Spread of Invasive Alien Plants: Approaches and Challenges, International Plant Protection Congress, Hyderabad, India, November 2019.
- 11. Modeling the multi-pathway spread of agricultural pests using network science, International Plant Protection Congress, Hyderabad, India, November 2019.
- 12. Understanding the Role of Seasonal Food Trade Networks in Invasive Species Spread, SIAM Network Science, Snowbird, Utah, May 2019.
- 13. (**Invited**) How to stop an epidemic? Networked dynamical systems, games and near-optimal algorithms, Indian Institute of Technology, Dharwad, October 2018.
- 14. (**Invited**) Multi-pathway models to assess the threat of invasive species spread, Indian Agricultural Research Institute, Delhi, October 2018.
- 15. Multi-pathway models to understand the spread and impact of *Tuta absoluta*, International Conference on Biological Control (ICBC), September 2018.
- 16. (Webinar) New Approaches to Control the South American Tomato Leaf Miner *Tuta absoluta*, April 2018
- 17. Monitoring the spread of *Tuta absoluta* using a multi-layered network based modeling framework, 9th International IPM Symposium, Baltimore, March 2018
- (Invited) Modeling the Spread of Fall Armyworm, Fall Armyworm Workshop, Adis Ababa, 2017
- (Invited) Understanding the role of human-mediated pathways in pest spread: Case study of *Tuta absoluta*, 12th Arab Congress of Plant Protection, Hurghada, 2017
- Monitoring spread of T. absoluta using a multi-layered network based modeling framework, Symposium on Global Spread and Management of the South American Tomato Leafminer, Tuta absoluta. International Congress of Entomology, Orlando, 2016
- 21. (Invited) How to stop an epidemic? Games and near-optimal algorithms, *Dept.* of Computer Science and Automation, Indian Institute of Science, Bangalore, 2014
- 22. (Invited) Sensitivity of Dynamical Properties to Network Uncertainty, Dept. of Computer Science and Automation, Indian Institute of Science, Bangalore, 2013

SELECTED PUBLICATIONS

- 1. A. Fox, S. Swarup, and A. Adiga. A unifying information-theoretic perspective on evaluating generative models. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2025
- A. Adiga, Y. Trabelsi, T. Ferdousi, M. Marathe, S. Ravi, S. Swarup, A. K. Vullikanti, M. L. Wilson, S. Kraus, R. Basu, et al. Value-based resource matching with fairness criteria: Application to agricultural water trading. In AAMAS, 2024
- G. Harrison, A. Alabsi Aljundi, J. Chen, S. Ravi, A. K. Vullikanti, M. V. Marathe, and A. Adiga. Identifying complicated contagion scenarios from cascade data. In Proceedings of the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2023
- 4. R. Mishra, J. Heavey, G. Kaur, A. Adiga, and A. Vullikanti. Reconstructing an epidemic outbreak using steiner connectivity. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2023

- A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Using active queries to infer symmetric node functions of graph dynamical systems. *Journal of Machine Learning Research*, 2022
- J. McNitt, Y. Y. Chungbaek, H. Mortveit, M. Marathe, M. R. Campos, N. Desneux, T. Brévault, R. Muniappan, and A. Adiga. Assessing the multi-pathway threat from an invasive agricultural pest: Tuta absoluta in asia. *Proceedings of the Royal Society B*, 2019
- S. Saha, A. Adiga, B. A. Prakash, and A. K. S. Vullikanti. Approximation algorithms for reducing the spectral radius to control epidemic spread. In *Proceedings of the* 2015 SIAM International Conference on Data Mining, 2015
- A. Adiga, C. J. Kuhlman, H. S. Mortveit, and A. K. S. Vullikanti. Sensitivity of diffusion dynamics to network uncertainty. *Journal of Artificial Intelligence Research*, 2014

PUBLICATIONS Journal articles

- 34. S. A. Moon, R. Datta, T. Ferdousi, H. Baek, A. Adiga, A. Marathe, and A. Vullikanti. Graph-based prediction of spatio-temporal vaccine hesitancy from insurance claims data. *IEEE Access*, 2025
- 33. P. Bhattacharya, D. Machi, J. Chen, S. Hoops, B. Lewis, H. Mortveit, S. Venkatramanan, M. L. Wilson, A. Marathe, P. Porebski, et al. Novel multi-cluster workflow system to support real-time hpc-enabled epidemic science: Investigating the impact of vaccine acceptance on covid-19 spread. *Journal of Parallel and Distributed Computing*, 2024
- 32. J. Chen, P. Bhattacharya, S. Hoops, D. Machi, A. Adiga, H. Mortveit, S. Venkatramanan, B. Lewis, and M. Marathe. Role of heterogeneity: National scale data-driven agent-based modeling for the us covid-19 scenario modeling hub. *Epidemics*, 2024
- 31. P. Bhattacharya, J. Chen, S. Hoops, D. Machi, B. Lewis, S. Venkatramanan, M. L. Wilson, B. Klahn, A. Adiga, B. Hurt, et al. Data-driven scalable pipeline using national agent-based models for real-time pandemic response and decision support. *The International Journal of High Performance Computing Applications*, 2023
- A. Adiga, N. Palmer, Y. Y. Baek, H. Mortveit, and S. Ravi. Network models and simulation analytics for multi-scale dynamics of biological invasions. *Frontiers* in big Data, 2022
- A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Using active queries to infer symmetric node functions of graph dynamical systems. *Journal of Machine Learning Research*, 2022
- 28. M. R. de Campos, P. Béarez, E. Amiens-Desneux, L. Ponti, A. P. Gutierrez, A. Biondi, A. Adiga, and N. Desneux. Thermal biology of tuta absoluta: demographic parameters and facultative diapause. *Journal of Pest Science*, 2021
- A. Adiga, S. Ravi, and A. Vullikanti. Guest editorial: Special issue on emerging trends in modeling and analysis of complex systems. *Journal of the Indian Institute of Science*, 2021
- 26. J. Chen, S. Hoops, A. Marathe, H. Mortveit, B. Lewis, S. Venkatramanan, A. Haddadan, P. Bhattacharya, A. Adiga, A. Vullikanti, et al. Prioritizing allocation of covid-19 vaccines based on social contacts increases vaccination effectiveness. *MedRxiv*, 2021

- 25. V. Cedeno-Mieles, Z. Hu, Y. Ren, X. Deng, A. Adiga, C. Barrett, N. Contractor, S. Ekanayake, J. M. Epstein, B. J. Goode, et al. Networked experiments and modeling for producing collective identity in a group of human subjects using an iterative abduction framework. *Social Network Analysis and Mining*, 2020
- 24. A. S. Poudel, B. B. Shrestha, M. D. Joshi, R. Muniappan, A. Adiga, S. Venkatramanan, and P. K. Jha. Predicting the current and future distribution of the invasive weed ageratina adenophora in the chitwan–annapurna landscape, nepal. *Mountain Research and Development*, 2020
- 23. S. Venkatramanan, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. Sah, A. Giri, L. Colavito, K. Nitin, et al. Modeling commodity flow in the context of invasive species spread: Study of tuta absoluta in nepal. *Crop Protection*, 2020
- 22. J. McNitt, Y. Y. Chungbaek, H. Mortveit, M. Marathe, M. R. Campos, N. Desneux, T. Brévault, R. Muniappan, and A. Adiga. Assessing the multi-pathway threat from an invasive agricultural pest: Tuta absoluta in asia. *Proceedings of the Royal Society B*, 2019
- 21. S. Maharjan, B. B. Shrestha, M. D. Joshi, A. Devkota, R. Muniappan, A. Adiga, and P. K. Jha. Predicting suitable habitat of an invasive weed parthenium hysterophorus under future climate scenarios in chitwan annapurna landscape, nepal. *Journal of Mountain Science*, 2019
- A. Adiga, C. J. Kuhlman, M. V. Marathe, H. S. Mortveit, S. Ravi, and A. Vullikanti. Graphical dynamical systems and their applications to bio-social systems. *International Journal of Advances in Engineering Sciences and Applied Mathematics*, 2019
- A. Adiga, S. Chu, S. Eubank, C. J. Kuhlman, B. Lewis, A. Marathe, M. Marathe, E. K. Nordberg, S. Swarup, A. Vullikanti, et al. Disparities in spread and control of influenza in slums of delhi: findings from an agent-based modelling study. *BMJ open*, 2018
- A. Adiga, J. Babu, and L. S. Chandran. Sublinear approximation algorithms for boxicity and related problems. *Discrete Applied Mathematics*, 2018
- A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Inferring local transition functions of discrete dynamical systems from observations of system behavior. *Theoretical Computer Science*, 2017
- A. Adiga, H. Galyean, C. J. Kuhlman, M. Levet, H. S. Mortveit, and S. Wu. Activity in boolean networks. *Natural Computing*, 2017
- A. Fayad and A. Adiga. Monitoring the spread and management of tuta absoluta. Current Science (00113891), 2017
- 14. M. R. Campos, A. Biondi, A. Adiga, R. N. Guedes, and N. Desneux. From the western palaearctic region to beyond: Tuta absoluta 10 years after invading europe. *Journal of Pest Science*, 2017
- Y. Zhang, A. Adiga, S. Saha, A. Vullikanti, and B. A. Prakash. Near-optimal algorithms for controlling propagation at group scale on networks. *IEEE Trans*actions on Knowledge and Data Engineering, 2016
- A. Adiga, A. Agashe, S. Arifuzzaman, C. L. Barrett, R. J. Beckman, K. R. Bisset, J. Chen, Y. Chungbaek, S. G. Eubank, S. Gupta, et al. Generating a synthetic population of the united states. *Network Dynamics and Simulation Science Laboratory, Tech. Rep. NDSSL*, 2015
- A. Adiga, L. S. Chandran, and N. Sivadasan. Lower bounds for boxicity. Combinatorica, 2014

- S. Wu, A. Adiga, and H. S. Mortveit. Limit cycle structure for dynamic bithreshold systems. *Theoretical Computer Science*, 2014
- A. Adiga and L. S. Chandran. Representing a cubic graph as the intersection graph of axis-parallel boxes in three dimensions. SIAM Journal on Discrete Mathematics, 2014
- A. Adiga, J. Babu, and L. S. Chandran. A constant factor approximation algorithm for boxicity of circular arc graphs. *Discrete Applied Mathematics*, 2014
- A. Adiga, C. J. Kuhlman, H. S. Mortveit, and A. K. S. Vullikanti. Sensitivity of diffusion dynamics to network uncertainty. *Journal of Artificial Intelligence Research*, 2014
- 6. A. Adiga, L. S. Chandran, and R. Mathew. Cubicity, degeneracy, and crossing number. *European Journal of Combinatorics*, 2014
- A. Adiga, D. Bhowmick, and L. S. Chandran. Boxicity and poset dimension. SIAM Journal on Discrete Mathematics, 2011
- 4. A. Adiga, D. Bhowmick, and L. S. Chandran. The hardness of approximating the boxicity, cubicity and threshold dimension of a graph. *Discrete applied mathematics*, 2010
- 3. A. Adiga and L. S. Chandran. Cubicity of interval graphs and the claw number. Journal of Graph Theory, 2010
- 2. A. Adiga and L. S. Chandran. Cubicity of interval graphs and the claw number. Electronic Notes in Discrete Mathematics, 2009
- 1. A. Adiga. Cubicity of threshold graphs. Discrete mathematics, 2009

Refereed conference proceedings

- 49. A. Fox, S. Swarup, and A. Adiga. A unifying information-theoretic perspective on evaluating generative models. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2025
- 48. Z. Qiu, A. Adiga, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, R. E. Stearns, and A. Vullikanti. Learning the topology and behavior of discrete dynamical systems. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2024
- 47. A. Adiga, Y. Trabelsi, T. Ferdousi, M. Marathe, S. Ravi, S. Swarup, A. K. Vullikanti, M. L. Wilson, S. Kraus, R. Basu, et al. Value-based resource matching with fairness criteria: Application to agricultural water trading. In AAMAS, 2024
- A. A. Aljundi, G. Harrison, J. Chen, M. V. Marathe, H. Mortveit, A. Vullikanti, and A. Adiga. A network-based analytics framework for high-resolution agentbased epidemic simulation ensembles. In 2023 Winter Simulation Conference (WSC), 2023
- 45. G. Harrison, A. Alabsi Aljundi, J. Chen, S. Ravi, A. K. Vullikanti, M. V. Marathe, and A. Adiga. Identifying complicated contagion scenarios from cascade data. In Proceedings of the 29th ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2023
- 44. T. Ferdousi, A. Adiga, M. Wilson, S. Ravi, A. Vullikanti, M. V. Marathe, S. Swarup, M. Liu, K. Rajagopalan, and J. Adam. A machine learning framework to explain complex geospatial simulations: A climate change case study. In 2023 Winter Simulation Conference (WSC), 2023

- 43. R. Mishra, J. Heavey, G. Kaur, A. Adiga, and A. Vullikanti. Reconstructing an epidemic outbreak using steiner connectivity. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2023
- Y. Trabelsi, A. Adiga, S. Kraus, S. Ravi, and D. J. Rosenkrantz. Resource sharing through multi-round matchings. In *Proceedings of the AAAI Conference* on Artificial Intelligence, 2023
- 41. A. Adiga, N. Palmer, S. Sinha, P. Waghalter, A. Dave, D. P. Lazarte, T. Brévault, A. Apolloni, H. Mortveit, Y. Y. Baek, et al. Realistic commodity flow networks to assess vulnerability of food systems. In *Complex Networks & Their Applications* X: Volume 1, Proceedings of the Tenth International Conference on Complex Networks and Their Applications COMPLEX NETWORKS 2021 10, 2022
- 40. Y. Trabelsi, A. Adiga, S. Kraus, and S. Ravi. Maximizing resource allocation likelihood with minimum compromise. In *Proceedings of the 21st International Conference on Autonomous Agents and Multiagent Systems*, 2022
- 39. J. Chen, S. Hoops, A. Marathe, H. Mortveit, B. Lewis, S. Venkatramanan, A. Haddadan, P. Bhattacharya, A. Adiga, A. Vullikanti, et al. Effective social network-based allocation of covid-19 vaccines. In *Proceedings of the 28th ACM* SIGKDD Conference on Knowledge Discovery and Data Mining, 2022
- Y. Trabelsi, A. Adiga, S. Kraus, and S. Ravi. Resource allocation to agents with restrictions: Maximizing likelihood with minimum compromise. In *European Conference on Multi-Agent Systems*, 2022
- 37. D. J. Rosenkrantz, A. Adiga, M. Marathe, Z. Qiu, S. Ravi, R. Stearns, and A. Vullikanti. Efficiently learning the topology and behavior of a networked dynamical system via active queries. In *International Conference on Machine Learning*, 2022
- 36. R. Mishra, S. Eubank, M. Nath, M. Amundsen, and A. Adiga. Community detection using moore-shannon network reliability: application to food networks. In *International Conference on Complex Networks and Their Applications*, 2022
- 35. P. Bhattacharya, D. Machi, J. Chen, S. Hoops, B. Lewis, H. Mortveit, S. Venkatramanan, M. L. Wilson, A. Marathe, P. Porebski, et al. Ai-driven agent-based models to study the role of vaccine acceptance in controlling covid-19 spread in the us. In 2021 IEEE International Conference on Big Data (Big Data), 2021
- 34. S. Hoops, J. Chen, A. Adiga, B. Lewis, H. Mortveit, H. Baek, M. Wilson, D. Xie, S. Swarup, S. Venkatramanan, et al. High performance agent-based modeling to study realistic contact tracing protocols. In 2021 Winter Simulation Conference (WSC), 2021
- 33. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, R. E. Stearns, and A. Vullikanti. Learning coalition-based interactions in networked social systems. In Association for the Advancement of Artificial Intelligence Conference 2020, 2020
- 32. A. Adiga, C. Kuhlman, M. Marathe, S. Ravi, D. Rosenkranz, R. Stearns, and A. Vullikanti. Bounds and complexity results for learning coalition-based interaction functions in networked social systems. In *Proceedings of the AAAI Conference on Artificial Intelligence*, 2020
- A. Adiga, S. Kraus, O. Maksimov, and S. S. Ravi. Boolean games: Inferring agents' goals using taxation queries. In *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence*, 2020

- 30. A. Adiga, C. Barrett, S. Eubank, C. J. Kuhlman, M. V. Marathe, H. Mortveit, S. Ravi, D. J. Rosenkrantz, R. E. Stearns, S. Swarup, et al. Validating agentbased models of large networked systems. In 2019 Winter Simulation Conference (WSC), 2019
- Z. Hu, X. Deng, B. J. Goode, N. Ramakrishnan, P. Saraf, N. Self, A. Adiga, G. Korkmaz, C. J. Kuhlman, D. Machi, et al. On the modeling and agent-based simulation of a cooperative group anagram game. In 2019 Winter Simulation Conference (WSC), 2019
- 28. V. Cedeno-Mieles, Z. Hu, X. Deng, Y. Ren, A. Adiga, C. Barrett, S. Ekanayake, G. Korkmaz, C. J. Kuhlman, D. Machi, et al. Mechanistic and data-driven agentbased models to explain human behavior in online networked group anagram games. In *Proceedings of the 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining*, 2019
- G. Fox, J. A. Glazier, J. Kadupitiya, V. Jadhao, M. Kim, J. Qiu, J. P. Sluka, E. Somogyi, M. Marathe, A. Adiga, et al. Learning everywhere: Pervasive machine learning for effective high-performance computation. In 2019 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW), 2019
- A. Adiga, C. J. Kuhlman, M. Marathe, S. Ravi, and A. Vullikanti. Pac learnability of node functions in networked dynamical systems. In *International Conference* on Machine Learning, 2019
- 25. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Using active queries to learn local stochastic behaviors in social networks. In Complex Networks and Their Applications VII: Volume 2 Proceedings The 7th International Conference on Complex Networks and Their Applications COMPLEX NETWORKS 2018 7, 2019
- 24. M. Nath, S. Venkatramanan, B. Kaperick, S. Eubank, M. V. Marathe, A. Marathe, and A. Adiga. Using network reliability to understand international food trade dynamics. In Complex Networks and Their Applications VII: Volume 1 Proceedings The 7th International Conference on Complex Networks and Their Applications COMPLEX NETWORKS 2018 7, 2019
- 23. A. Adiga, V. Cedeno-Mieles, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Inferring probabilistic contagion models over networks using active queries. In *Proceedings of the 27th ACM International Conference on Information and Knowledge Management*, 2018
- 22. A. Adiga, C. Kuhlman, M. Marathe, R. SS, D. Rosenkrantz, and R. Stearns. Learning the behavior of a dynamical system via a "20 questions" approach. In Proceedings of the AAAI Conference on Artificial Intelligence, 2018
- 21. A. Adiga, A. D. Friedman, and S. Raghvendra. A k-median based online algorithm for the stochastic k-server problem. In *International Workshop on Approximation and Online Algorithms*, 2017
- 20. S. Venkatramanan, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. P. Sah, A. Giri, L. A. Colavito, K. Nitin, et al. Towards robust models of food flows and their role in invasive species spread. In 2017 IEEE International Conference on Big Data (Big Data), 2017
- A. Adiga, S. Venkat, and A. Vullikanti. To delay or not: temporal vaccination games on networks. In *IEEE INFOCOM 2016-The 35th Annual IEEE International Conference on Computer Communications*, 2016
- A. Adiga and A. Vullikanti. Temporal vaccination games under resource constraints. In Proceedings of the AAAI Conference on Artificial Intelligence, 2016

- 17. S. Saha, A. Adiga, B. A. Prakash, and A. K. S. Vullikanti. Approximation algorithms for reducing the spectral radius to control epidemic spread. In Proceedings of the 2015 SIAM International Conference on Data Mining, 2015
- A. Adiga, C. J. Kuhlman, H. S. Mortveit, and S. Wu. Effect of graph structure on the limit sets of threshold dynamical systems. In *Cellular Automata and Discrete Complex Systems: 21st IFIP WG 1.5 International Workshop, AUTOMATA* 2015, Turku, Finland, June 8-10, 2015. Proceedings 21, 2015
- 15. A. Adiga, H. Galyean, C. J. Kuhlman, M. Levet, H. S. Mortveit, and S. Wu. Network structure and activity in boolean networks. In *Cellular Automata* and Discrete Complex Systems: 21st IFIP WG 1.5 International Workshop, AUTOMATA 2015, Turku, Finland, June 8-10, 2015. Proceedings 21, 2015
- A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Complexity of inferring local transition functions of discrete dynamical systems. In *Implementation and Application of Automata: 20th International Conference, CIAA 2015, Umeå, Sweden, August 18-21, 2015, Proceedings 20*, 2015
- Y. Zhang, A. Adiga, A. Vullikanti, and B. A. Prakash. Controlling propagation at group scale on networks. In 2015 IEEE International Conference on Data Mining, 2015
- A. Adiga, R. Beckman, K. Bisset, J. Chen, Y. Chungbaek, S. Eubank, H. Marathe, E. Nordberg, C. Rivers, P. Stretz, et al. Synthetic populations for epidemic modeling. In *Proceedings of the International Conference on Computation and Social Sciences (ICCSS)*, *Helsinki, Finland*, 2015
- S. Saha, A. Adiga, and A. Vullikanti. Equilibria in epidemic containment games. In Proceedings of the AAAI Conference on Artificial Intelligence, 2014
- A. Adiga, A. K. S. Vullikanti, and D. Wiggins. Subgraph enumeration in dynamic graphs. In 2013 IEEE 13th International Conference on Data Mining, 2013
- 9. A. Adiga, M. Marathe, H. Mortveit, S. Wu, and S. Swarup. Modeling urban transportation in the aftermath of a nuclear disaster: The role of human behavioral responses. In *The Conference on Agent-Based Modeling in Transportation Planning and Operations, Blacksburg, VA*, 2013
- A. Adiga and A. K. S. Vullikanti. How robust is the core of a network? In Machine Learning and Knowledge Discovery in Databases: European Conference, ECML PKDD 2013, Prague, Czech Republic, September 23-27, 2013, Proceedings, Part I 13, 2013
- A. Adiga, H. S. Mortveit, and S. Wu. Route stability in large-scale transportation systems. In *The Workshop on Multiagent Interaction Networks (MAIN), held in* conjunction with AAMAS, 2013
- A. Adiga, J. Babu, and L. S. Chandran. Polynomial time and parameterized approximation algorithms for boxicity. In *International Symposium on Parameterized and Exact Computation*, 2012
- 5. A. Adiga and S. L. Chandran. Representing a cubic graph as the intersection graph of axis-parallel boxes in three dimensions. In *Proceedings of the twenty-eighth annual symposium on Computational geometry*, 2012
- A. Adiga, R. Chitnis, and S. Saurabh. Parameterized algorithms for boxicity. In International Symposium on Algorithms and Computation, 2010
- 3. A. Adiga, D. Bhowmick, and L. S. Chandran. Computing with cells: membrane systems. In *Proceedings of the 16th annual international conference on Computing and combinatorics*, 2010

- A. Adiga, D. Bhowmick, and L. S. Chandran. Boxicity and poset dimension. In International Computing and Combinatorics Conference, 2010
- A. Adiga, K. R. Ramakrishnan, and B. Adiga. A design and implementation of orthonormal symmetric wavelet transform using prcc filter banks. In 2003 IEEE International Conference on Acoustics, Speech, and Signal Processing, 2003. Proceedings. (ICASSP'03)., 2003

Workshop/Extended abstract

- 3. O. B. Hoque, S. Swarup, A. Adiga, S. K. Nouwakpo, and M. Marathe. Irrnet: Advancing irrigation mapping with incremental patch size training on remote sensing imagery. In *Proceedings of the IEEE/CVF Conference on Computer* Vision and Pattern Recognition, 2024
- A. Adiga, C. Kuhlman, M. Marathe, S. Ravi, D. Rosenkrantz, and D. Stearns. Inferring users' choice functions in networked social systems through active queries. In *The 7th International Workshop on Computational Social Choice* (COMSOC-2018), 2018
- S. Venkatramanan, A. Adiga, A. Marathe, S. Eubank, M. Marathe, and R. Muniappan. Towards an integrated network-based approach to modeling the dynamics of invasive plant pests. In *KDD*'2016 Workshop on Data Science for Food, Energy and Water (DS-FEW), 2016

Reports

 E. Heinrichs, J. Sidhu, R. Muniappan, A. Fayad, A. Adiga, A. Marathe, J. Mcnitt, and S. Venkatramanan. Pest risk assessment of the fall armyworm, spodoptera frugiperda in egypt. *Feed the Future. The US Government's Global Hunger and Food Security Initiative*, 2018

PhD (GRA)

STUDENTS CURRENT/PAST

Amro Aljundi (Spring'23–) (Adviser: Madhav Marathe), **Ritwick Mishra** (Spring'23–) (Co-adviser with Anil Vullikanti), Galen Harrison (Spring'23–) (Adviser: Madhav Marathe), Rituparna Datta (Spring'23–) (Adviser: Anil Vullikanti), Prathyush Sambaturu (Thesis committee), Sichao Wu (Adviser: Henning Mortveit)

Masters (GRA)

Hongze Chen (Spring'24)
Ritwick Mishra (Fall'21–Spring'23) (Co-adviser with Anil Vullikanti),
Sanchit Sinha (Spring'21)
Aniruddha Dave (Fall'20)
Manisha Sudhir (Spring'20–Spring'21) (Co-adviser with Anil Vullikanti),
Daniel Perez Lazarte (Fall'19, Spring'20)
Joseph McNitt (Thesis adviser: Henning Mortveit)

Undergraduates

Alex Fetea (Summer'23–Fall'24) (Co-adviser Samarth Swarup) Alexander Yao (Summer'24) (Co-adviser Samarth Swarup) Chris Goodhart (Summer'23) (Co-adviser Samarth Swarup), Andrew Ma (Summer'23) (Co-adviser Samarth Swarup), William Mueller (Summer'22, Fall'22), Clark Mollencop (Summer'22), Neha Pattanaik (Summer'21), Penina Waghalter (Summer'21), Nicholas Palmer (Summer'21), Johnny Yang (Fall'20, Spring'21), Surbhi Singh (Fall'19–Spring'20), Ethan Choo (Summer'19), Katie

Liu (Summer'19), Bryan Kaperick (Spring'16–Spring'17), and Amleshwar Kumar (Intern: Fall'16)

High school

Alexis Fox (Fall'23–Sprint'24) (Co-adviser Samarth Swarup) Manu Amundsen (Spring'21)

Student thesis/project committee

Tanay Mehta (PhD, Northeastern University), Sudip Saha (PhD, Virginia Tech)

Professional Service

Guest editor

Journal of Indian Institute of Science (2021)

Senior Technical Program Committee member IJCAI (2021–2023)

Technical Program Committee member

NeurIPS (2025), IJCAI (2024,2025), IJCAI AI and Social Good (2025), KDD (2025), KDD Data Track (2025), AAMAS (2025), ICLR (2025), AAAI (2021–2025), HiPC (2024), BigData (2024), ANNSIM (2021), AIKE (2018–2021), PhD-ASONAM (2020), INFO-COM (2019), CSoNet (2016), CONECCT (2015), SDM-Networks (2015), SIAMNS (2015)

Grant Review

USDA (Fall'24, Fall'23, Spring'23, Fall'22, Fall'21, Fall'20 and Spring'20) (Grant review panelist)

NSF (2018) (Grant review panelist)

National Fund for Scientific and Technological Development (FONDECYT), Chile

Reviewer

Preventive Veterinary Medicine (2025), NITK thesis (2025), SODA (2025), ICML (2024), Plos Comp. Bio. (2023), AAAI (2023), SNAM (2022), Entomologia Generalis (2022), Entomologia Generalis (2022), PlosOne (2022), ICML (2022 multiple papers), Biological Control (2022), Applied Network Science (2019–2022), Nature Comm. Biology (2021), Journal of Pest Science (2020, 2018), WG (2020), International Journal of epidemiology (2019), Pest Management Science (2019), Journal of Parallel and Distributed Computing (2019), Australasian Journal of Combinatorics (2018, 2015), FPSAC (2017), ACM Transactions on Algorithms (2017), Journal of Royal Society Interface (2017), INFOCOM (2016, 2015), Order (2015), Algorithmica (2014), Journal of Autonomous Agents and Multi-Agent Systems (2013), Information Processing Letters (2012), Graphs and Combinatorics (2011), CATS (2011)

Advisory Committee E²JDJ

Miscellaneous

- $\circ~$ Student and postdoc hiring committee in NSSAC 2018-2021
- $\circ\,$ Student and postdoc hiring committee in NDSSL 2017-2018
- $\circ~$ Member of graduate students admission team in NDSSL for the Fall'16 admissions
- Organized NDSSL graduate seminar series for the academic year 2013-2014