Abhijin Adiga

CONTACT INFORMATION	Network Systems Science and Advanced Computing (NSSAC)
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CURRENT POSITION	**Research Associate Professor** 2022 –
	Network Systems Science and Advanced Computing (NSSAC)
	University of Virginia

RESEARCH INTERESTS AND FOCUS

Broadly, my interests are in network science, data science, algorithm design, combinatorics, machine learning and game theory. My current focus is on studying diffusion processes using network dynamical systems and machine learning with application to the spread of invasive species, infectious diseases, and other socio-technical phenomena. There are three main thrusts to my research. Through large collaborative efforts, I design and analyze data- and process-driven models using domain-specific knowledge. Secondly, I strive to advance the theoretical foundations of such models to create robust models that can be applied in data-poor environments. Thirdly, I develop efficient practical solutions with provable guarantees for various computational problems that arise in the target applications.

WORK EXPERIENCE

Research Assistant Professor		2018 – 2022
Network Systems Science and Advanced Computing (NSSAC)		
University of Virginia		
Research Assistant Professor		Jul 2016 – Oct 2018
Senior Research Associate		May 2014 – Jul 2016
Postdoctoral Associate		October 2011 – May 2014
Network Dynamics and Simulation Science Laboratory		
Biocomplexity Institute of Virginia Tech		
Research Associate		March 2011 – September 2011
Dept. of Computer Science and Automation, IISc		
Beceem Communications Pvt Ltd		August 2004 – July 2006
Algorithm design for WiMax (802.16)		
Project Associate		October 2003 – April 2004
Project Associate		October 2000 – August 2001
Dept. of Electrical Engineering, IISc		

EDUCATION	**PhD:** August 2006 – March 2011
	Dept. of Computer Science and Automation
	Indian Institute of Science, Bangalore, India
	Master of Science (Engg): August 2001 – August 2003
	Dept. of Electrical Engineering,

Indian Institute of Science, Bangalore, India

Bachelor of Engineering: 1996 – 2000
Bangalore University (B.M.S. College of Engineering)
Telecommunication Engineering

GRANTS

- USDA NIFA Foundational and Applied Science Program: *Network Models of Food Systems and their Application to Invasive Species Spread*
  Amount: $400,000; Duration: Sep'19–Aug'23
  Role: PI

- USAID IPM Innovation Labs: *Assessment of Invasive Alien Species Distribution in the Chitwan-Annapurna-Landscape (CHAL) Region, Nepal*
  Amount: $150,000; Duration: Jan'19–Nov'21
  Role: Co-PI

- USAID Egypt Mission: *Pest Risk Assessment of the Fall Armyworm, Spodoptera frugiperda in Egypt*
  Amount: $18,000; Duration: Oct'17–Dec'17
  Role: Co PI

- USAID IPM Innovation Labs: *A High-resolution Interaction Based Approach to Modeling the Spread of Agricultural Invasive Species*
  Amount: $1,000,000 ($800,000 for Virginia Tech); Duration: Oct'15–Nov'21
  Role: PI

Current efforts/pending:

- USAID Feed the Future Innovation Lab for Current and Emerging Threats to Crops Catalog of Federal Domestic Assistance, 2021.

- NSF HDR Institute: Data Science for Transportation, Epidemiology and Power (DataSTEP), 2021 (submitted).

- NSF AI Institute: Agricultural AI for Transforming Workforce and Decision Support (AgAID), 2021.

AWARDS

- IJCAI-22 Distinguished PC Member (top 3%).

- IJCAI-21 Distinguished SPC Member.

- "DSFEW Early Career Researchers Travel Fund", KDD 2016.

- "Honorable Mention For Outstanding Novelty of Research Question" award for the paper "Sensitivity of Diffusion Dynamics to Network Uncertainty" in AAAI'13.

- Infosys Fellow: awarded to select PhD candidates in IISc by Infosys Technologies Ltd.

- Secured All India Rank of 34 in GATE 2000 (EC), a national level entrance exam for post graduate studies.

- Ranked 7th in Bangalore University in Telecommunication Engg. (Year 2000).

NEWS

- [Monitoring and managing the tomato leafminer](#), The Niche, Autumn 2021.
- [Virtual agents of change: How computers are mapping Covid-19's future](#), Knowable Magazine, 2020.
- [Agrilinks article on USAID Invasive Species project; 2020.](#)
- [Charlottesville News (CBS19) announcing the USDA FACT project; 2019.](#)
- [Virginia Tech provides key intel in U.S. and Egyptian-led battle against a major pest; 2018](#)
- [Countries get heads up about leafminer invasion thanks to Virginia Tech](#) (also picked up by Wisconsin Farmer and Agrilinks)
- [Virginia Tech awards more than $11 million to help feed people in developing countries](#)
- [Virginia Tech Research Team Fights the Spread of Invasive Pests](#)

PROGRAMMATIC CONTRIBUTIONS

- 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 comparative 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.
- Simulation analytics framework: PENDING
- 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.
- 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.

Transdisciplinary team science

My 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. How to Stop an Epidemic? Network Dynamics and Simulation Systems, CheckedIt, India (virtual), February 2022.

2. Boolean Games: Inferring Agents' Goals Using Taxation Queries, International Joint Conference on Artificial Intelligence (IJCAI'20) (virtual), January 2021.

3. A Deep Learning Framework for Invasive Species Mapping using High-Resolution Satellite Imagery, ASPRS 2020 Annual Conference (virtual), June 2020.

4. (**Invited**) Network Dynamical Systems: Theory and Applications, Indian Institute of Technology, Hyderabad, India, November 2019.

5. Modern AI Techniques to Understand the Spatio-temporal Spread of Invasive Alien Plants: Approaches and Challenges, International Plant Protection Congress, Hyderabad, India, November 2019.

6. Modeling the multi-pathway spread of agricultural pests using network science, International Plant Protection Congress, Hyderabad, India, November 2019.

7. Understanding the Role of Seasonal Food Trade Networks in Invasive Species Spread, SIAM Network Science, Snowbird, Utah, May 2019.

8. (**Invited**) How to stop an epidemic? Networked dynamical systems, games and near-optimal algorithms, Indian Institute of Technology, Dharwad, October 2018.

9. (**Invited**) Multi-pathway models to assess the threat of invasive species spread, Indian Agricultural Research Institute, Delhi, October 2018.

10. Multi-pathway models to understand the spread and impact of *Tuta absoluta*, International Conference on Biological Control (ICBC), September 2018.

11. (**Webinar**) New Approaches to Control the South American Tomato Leaf Miner *Tuta absoluta*, April 2018

12. Monitoring the spread of *Tuta absoluta* using a multi-layered network based modeling framework, *9th International IPM Symposium*, Baltimore, March 2018

13. (**Invited**) Modeling the Spread of Fall Armyworm, *Fall Armyworm Workshop*, Adis Ababa, 2017

14. (**Invited**) Understanding the role of human-mediated pathways in pest spread: Case study of *Tuta absoluta*, *12th Arab Congress of Plant Protection*, Hurghada, 2017

15. 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

16. (**Invited**) How to stop an epidemic? Games and near-optimal algorithms, *Dept. of Computer Science and Automation, Indian Institute of Science*, Bangalore, 2014

17. (**Invited**) Sensitivity of Dynamical Properties to Network Uncertainty, *Dept. of Computer Science and Automation, Indian Institute of Science*, Bangalore, 2013

PUBLICATIONS   **Journal articles**

1. 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*, 23(251):1–43, 2022

2. 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*, 5, 2022

3. 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*, 10(1):1–43, 2020

4. 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*, 40(2):R61, 2020

5. 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*, 23(251):1–43, 2022

6. 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*, 5, 2022

7. 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*, pages 1–14, 2020

8. J. McNitt, Y. Y. Chungbaek, H. Mortveit, M. Madhav, R. C. Mateus, D. Nicolas, B. Thierry, M. Rangaswamy, and A. Adiga. Assessing the Multi-pathway Threat from an Invasive Agricultural Pest: *Tuta absoluta* in Asia. *Proc. R. Soc. B*, 2019

9. 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

10. S. Venkatramanan, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. P. Sah, A. P. Giri, L. A. Colavito, K. S. Nitin, et al. Modeling commodity flow in the context of invasive species spread: Study of *Tuta absoluta* in Nepal. *Crop Protection*, 135:104736, 2020

11. 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*, 11(2):153–171, 2019

12. 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*, 8(1):e017353, 2018

13. A. Adiga, J. Babu, and L. S. Chandran. Sublinear approximation algorithms for boxicity and related problems. *Discrete Applied Mathematics*, 236:7–22, 2018

14. M. R. Campos, A. Biondi, A. Adiga, R. N. C. Guedes, and N. Desneux. From the Western Palaearctic region to beyond: *Tuta absoluta* 10 years after invading Europe. *Journal of Pest Science*, 90(3):787–796, 2017

15. 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*, 679:126–144, 2017

16. A. Adiga, H. Galyean, C. J. Kuhlman, M. Levet, H. S. Mortveit, and S. Wu. Activity in boolean networks. *Natural Computing*, 16(3):427–439, 2017

17. Y. Zhang, A. Adiga, S. Saha, A. Vullikanti, and B. A. Prakash. Near-optimal algorithms for controlling propagation at group scale on networks. *IEEE Transactions on Knowledge and Data Engineering*, 28(12):3339–3352, 2016

18. A. Adiga, C. Kuhlman, H. S. Mortveit, and A. K. S. Vullikanti. Sensitivity of diffusion dynamics to network uncertainty. *Journal of Artificial Intelligence Research*, 51:207–226, 2014. **(invited: best papers in AAAI'13)**

19. 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*, 28(3):1515–1539, 2014

20. A. Adiga, J. Babu, and L. S. Chandran. A constant factor approximation algorithm for boxicity of circular arc graphs. *Discrete Applied Mathematics*, 178:1–18, 2014

21. S. Wu, A. Adiga, and H. S. Mortveit. Limit cycle structure for dynamic bi-threshold systems. *Theoretical Computer Science*, 559:34–41, 2014

22. A. Adiga, L. Chandran, and N. Sivadasan. Lower bounds for boxicity. *Combinatorica*, pages 1–25, 2014

23. A. Adiga, L. S. Chandran, and R. Mathew. Cubicity, degeneracy, and crossing number. *European Journal of Combinatorics*, 35:2–12, 2014

24. A. Adiga, D. Bhowmick, and L. S. Chandran. Boxicity and poset dimension. *SIAM Journal on Discrete Mathematics*, 25:1687, 2011

25. A. Adiga, D. Bhowmick, and L. Sunil Chandran. The hardness of approximating the boxicity, cubicity and threshold dimension of a graph. *Discrete Applied Mathematics*, 158(16):1719–1726, 2010

26. A. Adiga and L. S. Chandran. Cubicity of interval graphs and the claw number. *Journal of Graph Theory*, 65(4):323–333, 2010

27. A. Adiga. Cubicity of threshold graphs. *Discrete Mathematics*, 309(8):2535–2537, 2009

Refereed conference proceedings

1. Y. Trabelsi, A. Adiga, S. Kraus, D. Rosenkrantz, and S. Ravi. Resource sharing through multi-round matchings. In *Thirty fifth AAAI Conference on Artificial Intelligence*, 2023

2. R. Mishra, G. Kaur, J. Heavey, A. Adiga, and A. Vullikanti. Reconstructing an epidemic outbreak using steiner connectivity. In *Thirty fifth AAAI Conference on Artificial Intelligence*, 2023

3.

4. Y. Trabelsi, A. Adiga, S. Kraus, D. Rosenkrantz, and S. Ravi. Resource sharing through multi-round matchings. In *Thirty fifth AAAI Conference on Artificial Intelligence*, 2023

5. Y. Trabelsi, A. Adiga, S. Kraus, , and S. Ravi. Resource allocation to agents with restrictions: Maximizing likelihood with minimum compromise. In *The 19th European Conference on Multi-Agent Systems (EUMAS)*, 2022

6. 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*, page 10943420221127034, 2022

7. 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*, pages 18796–18808. PMLR, 2022

8. 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. *Proceedings of the KDD Health Day*, 2022

9. 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*, pages 1738–1740, 2022

10. 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 *International Conference on Complex Networks and Their Applications*, pages 168–179. Springer, Cham, 2021

11. 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)*, pages 1566–1574. IEEE, 2021

12. 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)*, pages 1–12. IEEE, 2021

13. A. Adiga, S. Kraus, O. Maksimov, and S. S. Ravi. Boolean games: Inferring agents' goals using taxation queries. In C. Bessiere, editor, *Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI-20*, pages 1585–1591. International Joint Conferences on Artificial Intelligence Organization, 7 2020. Main track

14. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. S. Ravi, D. J. Rosenkrantz, R. E. Stearns, and A. Vullikanti. Bounds and complexity results for learning coalition-based interaction functions in networked social systems. In *Thirty fourth AAAI Conference on Artificial Intelligence*, 2020

15. A. Adiga, C. Barrett, S. Eubank, C. J. Kuhlman, M. V. Marathe, H. Mortveit, S. S. Ravi, D. J. Rosenkrantz, R. E. Stearns, S. Swarup, and A. K. Vullikanti. Validating agent-based models of large networked systems. In *Winter Simulation Conference*, 2019

16. Z. Hu, X. Deng, A. Adiga, G. Korkmaz, C. J. Kuhlman, M. Dustin, M. V. Marathe, S. S. Ravi, Y. Ren, V. Cedeno-Mieles, S. Ekanayake, B. J. Goode, N. Ramakrishnan, P. Sarif, and N. Self. On the modeling and agent-based simulation of a cooperative group anagram games. In *Winter Simulation Conference*, 2019

17. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, and A. Vullikanti. PAC learnability of node functions in networked dynamical systems. In *International Conference on Machine Learning (ICML)*, 2019

18. V. Cedeno-Mieles, Z. Hu, X. Deng, Y. Ren, A. , Adiga, C. Barrett, S. Ekanayake, G. Korkmaz, C. J. Kuhlman, D. Machi, M. V. Marathe, S. S. Ravi, B. J. Goode, N. Ramakrishnan, P. Saraf, and N. Self. Mechanistic and data-driven agent-based models to explain human behavior in online networked group anagram games. In *The 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2019

19. Y. Ren, V. Cedeno-Mieles, Z. Hu, X. Deng, A. Adiga, C. Barrett, S. Ekanayake, B. J. Goode, G. Korkmaz, C. J. Kuhlman, D. Machi, M. V. Marathe, N. Ramakrishnan, S. S. Ravi, P. Saraf, and N. Self. Generative modeling of human behavior and social interactions using abductive analysis. In *The 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2018

20. A. Adiga, V. Cedeno-Mieles, C. J. Kuhlman, M. V. Marathe, S. S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Inferring probabilistic contagion models over networks using active queries. In *The 27th ACM International Conference on Information and Knowledge Management (CIKM '18)*, 2018

21. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Learning the behavior of a dynamical system via a "20 questions" approach. In *Thirty second AAAI Conference on Artificial Intelligence*, 2018

22. A. Adiga, D. Friedman, and S. Raghvendra. A k-median based online algorithm for the stochastic k-server problem. In *The 15th Workshop on Approximation and Online Algorithms (WAOA)*, 2017

23. S. Venkatramanan, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. P. Sah, A. P. Giri, L. A. Colavito, K. S. Nitin, V. Sridhar, R. Asokan, R. Muniappan, G. Norton, and A. Adiga. Towards robust models of food flows and their role in invasive species spread. In *IEEE International Conference on Big Data (Big Data)*, pages 435–444, Dec 2017

24. A. Adiga, S. Venkataramanan, and A. Vullikanti. To delay or not: temporal vaccination games on networks. INFOCOM, 2016

25. A. Adiga and A. Vullikanti. Temporal vaccination games under resource constraints. In *Thirtieth AAAI Conference on Artificial Intelligence*, 2016

26. A. Adiga, S. Chu, A. Marathe, and V. S. A. Kumar. Can social distancing compensate for the unvaccinated? In *The Computational Social Science Society of the Americas*, Santa Fe, NM, October 29 - November 1, 2015, 2015

27. Y. Zhang, A. Adiga, A. Vullikanti, and B. A. Prakash. Controlling propagation at group scale on networks. In *Data Mining (ICDM), 2015 IEEE International Conference on*, pages 619–628. IEEE, 2015

28. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. 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*, volume 9223, page 21. Springer, 2015

29. 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 (Automata)*, pages 210–223. Springer, 2015

30. 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 (Automata)*, pages 59–70. Springer, 2015

31. S. Saha, A. Adiga, B. A. Prakash, and A. K. S. Vullikanti. Approximation algorithms for reducing the spectral radius to control epidemic spread. In *Proc. 15th SIAM International Conference on Data Mining (SDM)*, 2015

32. S. Saha, A. Adiga, and A. K. S. Vullikanti. Equilibria in epidemic containment games. In *Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI)*, 2014

33. 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*, 2013

34. A. Adiga, A. K. S. Vullikanti, and D. Wiggins. Subgraph enumeration in dynamic graphs. In *Data Mining (ICDM), IEEE 13th International Conference on*, pages 11–20. IEEE, 2013

35. A. Adiga and A. K. S. Vullikanti. How robust is the core of a network? In *Machine Learning and Knowledge Discovery in Databases (ECML/PKDD)*, pages 541–556. Springer Berlin Heidelberg, 2013

36. A. Adiga, C. Kuhlman, H. S. Mortveit, and A. K. S. Vullikanti. Sensitivity of diffusion dynamics to network uncertainty. In *Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI)*, 2013. **(invited to Journal of Artificial Intelligence Research)**

37. A. Adiga and L. S. Chandran. Representing a cubic graph as the intersection graph of axis-parallel boxes in three dimensions. In *Symposium on Computational Geometry (SoCG)*, pages 387–396, 2012

38. A. Adiga, J. Babu, and L. S. Chandran. Polynomial time and parameterized approximation algorithms for boxicity. In *Parameterized and Exact Computation*, pages 135–146. Springer, 2012

39. A. Adiga, L. S. Chandran, and R. Mathew. Cubicity, degeneracy, and crossing number. In *IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, pages 176–190, 2011

40. A. Adiga, J. Babu, and L. Chandran. A constant factor approximation algorithm for boxicity of circular arc graphs. *Algorithms and Data Structures (WADS)*, pages 13–24, 2011

41. A. Adiga, R. Chitnis, and S. Saurabh. Parameterized algorithms for boxicity. *Algorithms and Computation (ISAAC)*, pages 366–377, 2010

42. A. Adiga, D. Bhowmick, and L. Chandran. Boxicity and poset dimension. *Computing and Combinatorics (COCOON)*, pages 3–12, 2010

43. A. Adiga and L. S. Chandran. Cubicity of interval graphs and the claw number. *Electronic Notes in Discrete Mathematics* (*EuroComb*), 34:471–475, 2009

44. A. Adiga, K. Ramakrishnan, and B. Adiga. A design and implementation of orthonormal symmetric wavelet transform using PRCC filter banks. In *Acoustics, Speech, and Signal Processing* (*ICASSP*), *IEEE International Conference on*, volume 6, pages VI–513. IEEE, 2003

Workshop/Extended abstract

1. 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*, pages 1738–1740, 2022

2. S. Eubank, R. Mishra, M. Nath, and A. Adiga. Communities in directed weighted food networks using moore-shannon network reliability. In *ComNets, NetSci*, 2022

3. 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*, pages 1585–1591, 2020

4. 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. *arXiv preprint arXiv:1902.10810*, 2019

5. A. Adiga, C. J. Kuhlman, M. V. Marathe, S. Ravi, D. J. Rosenkrantz, and R. E. Stearns. Inferring dynamical systems through active queries. In *SIAM Network Science*, 2019

6. A. Adiga, S. Venkatramanan, S. Wu, M. Marathe, S. Eubank, L. P. Sah, A. P. Giri, L. A. Colavito, and R. Muniappan. Understanding the role of seasonal food trade networks in invasive species spread. In *SIAM Network Science*, 2019

7. 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 *International Workshop on Complex Networks and their Applications*, pages 524–535. Springer, Cham, 2018

8. 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 *International Workshop on Complex Networks and their Applications*, pages 246–257. Springer, Cham, 2018

9. 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

10. S. Wu, H. Mortveit, A. Adiga, and S. Venkatramanan. GENEUS & application in pest diffusion. In *Workshop on Uncertainty Quantification and Data-Driven Modeling*, 2017

11. S. Venkatramanan, S. Wu, B. Shi, A. Marathe, S. Eubank, M. Marathe, and A. Adiga. Hybrid Models for Ecological and Anthropogenic Drivers of Pest Invasion: Case Study of Tuta absoluta in Nepal. In *nternational Conference on Biodiversity, Climate Change Assessment and Impacts in Livelihood*, 2017

12. V. Sridhar, K. S. Nitin, R. Asokan, and A. Adiga. Use of CLIMEX to Identify the Potential Areas for Spread of Tuta absoluta under Climate Change. In *nternational Conference on Biodiversity, Climate Change Assessment and Impacts in Livelihood*, 2017

13. S. Venkatramanan, A. Adiga, A. Marathe, S. Eubank, and M. Marathe. Towards an integrated network-based approach to modeling the dynamics of invasive plant pests. In *Poster at KDD'2016 Workshop on Data Science for Food, Energy and Water (DS-FEW)*, 2016

14. A. Adiga, A. Marathe, M. V. Marathe, and V. S. A. Kumar. Behavioral modeling for epidemic planning and response. In *The Computational Social Science Society of the Americas*, 2015

15. A. Adiga, R. Beckman, K. Bisset, et al. Synthetic populations for epidemic modeling. 2015. IC2S2

16. A. Adiga, H. S. Mortveit, and S. Wu. Route stability in large-scale transportation models. In *Workshop on Multiagent Interaction Networks, AAMAS*. 2012

Reports

1. E. A. 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. Technical report, Feed the Future Innovation Lab for Integrated Pest Management, USAID, 2018

STUDENTS CURRENT/PAST

Student thesis/project committee
Ritwick Mishra (Fall'21–) (Co-adviser with Anil Vullikanti for masters thesis)
Manisha Sudhir (Spring'20–Spring'21) (Co-adviser with Anil Vullikanti)
Prathyush Sambaturu (PhD, UVA)
Tanay Mehta (PhD, Northeastern University)
Sudip Saha (PhD, Virginia Tech)

PhD (GRA)
Sichao Wu (Thesis adviser: Henning Mortveit)

Masters (GRA)
Sanchit Sinha (Spring'21)
Aniruddha Dave (Fall'20)
Daniel Perez Lazarte (Fall'19, Spring'20)
Joseph McNitt (Thesis adviser: Henning Mortveit)

Undergraduates
William Mueller (Summer'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
Manu Amundsen (Spring'21)

PROFESSIONAL SERVICE

Guest editor
Journal of Indian Institute of Science (2021)

Senior Technical Program Committee member
IJCAI (2021–2022)

Technical Program Committee member
AAAI (2021–2022), ANNSIM (2021), AIKE (2018–2021), PhD-ASONAM (2020), INFOCOM (2019), CSoNet (2016), CONECCT (2015), SDM-Networks (2015), SIAMNS (2015)

Grant Review
USDA (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
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), INFO-COM (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
E^2JDJ

Miscellaneous

○ Student and postdoc hiring committee in NSSAC 2018-2021

○ Student and postdoc hiring committee in NDSSL 2017-2018

○ Member of graduate students admission team in NDSSL for the Fall'16 admissions

○ Organized NDSSL graduate seminar series for the academic year 2013-2014