

Abhijin Adiga

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| 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. | |
| EDUCATION | PhD: Dept. of Computer Science and Automation Indian Institute of Science, Bangalore, India | August 2006 – March 2011 |
| PUBLICATIONS COUNT | Journals: 32 Conference proceedings: 48 Workshops/posters/abstract: 14 | |
| GRANTS SUMMARY | PI: USAID \$1,100,000; USDA \$400,000 Co-PI: Two USAID grants \$170,000 | |
| MENTORSHIP | <ul style="list-style-type: none">◦ Co-advisor for two Masters students (Thesis accepted) and one PhD student.◦ Part of thesis committee for four PhD students. I advised on several parts of the thesis of two of them.◦ Research assistants (PhD 1 and Masters students 4)◦ Undergraduates: 9◦ High-school: 3 | |
| PROGRAMMATIC CONTRIBUTIONS | <ul style="list-style-type: none">◦ Development of a livestock digital twin/similar for addressing applications related to public health and environmental safety. I have presented multiple times to CDC on this topic.◦ As PI and Co-PI of the USAID and USDA projects, 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). | |

- COVID-19 response: I led the modeling and development of certain modules in the synthetic population generation pipeline. These tools have been applied to provide weekly inputs to various agencies during certain periods of the year 2020-21.
- DARPA NGS2: I contributed significantly to the theoretical aspects of this project. Our work 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.

SELECTED TALKS

1. **(Invited)** Unraveling Complexity with Network Science: Structure, Dynamics and Emergent Behavior, Jawaharlal Nehru Planetarium, Bengaluru, India, July 2025.
2. US-Scale High Resolution Digital Twin of Coupled Livestock, Wild Birds, and Human Populations Ecosystem, CDC (six presentations), September to December 2024.
3. 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.
4. **(Invited)** How to Stop an Epidemic? Network Dynamics and Simulation Systems, CheckedIt, India (virtual), February 2022.
5. **(Invited)** Learning the Local and Global Behavior of Dynamical Systems on Networks, Workshop on AI Socio-écosystème et résilience, Montpellier, France (virtual), November 2021.
6. **(Invited)** Network Dynamical Systems: Theory and Applications, Indian Institute of Technology, Hyderabad, India, November 2019.

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
2. 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
3. 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
4. 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
5. 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
6. 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

Details and Complete Lists

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| 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 | |
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