

# Abhijin Adiga

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CONTACT INFORMATION	Biocomplexity Institute University of Virginia <a href="https://abhijin.github.io">https://abhijin.github.io</a>	email: abhijin@virginia.edu phone: +1 540 204 6679
CURRENT POSITION	<b>Research Associate Professor</b> 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	<b>PhD:</b> 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"><li>◦ Co-advisor for two Masters students (Thesis accepted) and one PhD student.</li><li>◦ Part of thesis committee for four PhD students. I advised on several parts of the thesis of two of them.</li><li>◦ Research assistants (PhD 1 and Masters students 4)</li><li>◦ Undergraduates: 9</li><li>◦ High-school: 3</li></ul>	
PROGRAMMATIC CONTRIBUTIONS	<ul style="list-style-type: none"><li>◦ 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.</li><li>◦ 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).</li></ul>	

- 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