

SRINIVASAN VENKATRAMANAN

CONTACT INFO

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Research Interests

Areas: Computational modeling & simulation, Network science, Data analytics, Stochastic processes, Optimization;
Domains: Network epidemiology, Infectious disease forecasting, Human mobility modeling, Invasive species;

Professional Experience

2021 - now	Biocomplexity Institute & Initiative, University of Virginia	Research Assistant Professor
2018 - 2021	Biocomplexity Institute & Initiative, University of Virginia	Research Scientist
2017 - 2018	Biocomplexity Institute, Virginia Tech	Computational Health Data Scientist
2015 - 2017	Biocomplexity Institute, Virginia Tech	Postdoctoral Associate
2014 (May-Nov)	Department of Information Engineering, Chinese University of Hong Kong	Research Assistant
2007 (May-Aug)	Bell Research Labs India	Student Intern

Education

2008 - 2014	Indian Institute of Science	Ph.D. (ECE)
2004 - 2008	College of Engineering Guindy, Anna University	B.E. (ECE)

Funding

- PI: Geography and Respiratory Illness based Flu ForecastING (GRIFFIN), Council of State & Territorial Epidemiologists (CSTE), (\$125,000), 2023-2024
- PI: Strengthening Public Health Informatics Using Next-generation tools (SPHINX), Council of State & Territorial Epidemiologists (CSTE), (\$250,000), 2023-2024
- PI: Hybrid Approaches for Forecasting Flu and Projecting Under Feasible Futures (HAFFLPUFF), Council of State & Territorial Epidemiologists (CSTE), (\$125,000), 2022-2023
- PI: Leveraging multi-scale multi-model approaches to support scalable scenario-based projections, Centers for Disease Control and Prevention (as part of Scenario Modeling Consortium), (\$150,000), 2022-2024
- PI: Effective Communication of Localized Influenza Predictions from a Statistical Ensemble (ECLIPSE), Council of State & Territorial Epidemiologists (CSTE), (\$150,000), 2021-2022
- Senior Investigator: RAPID: Modeling and Analytics for COVID-19 Outbreak Response in India: A multi-institutional, US-India joint collaborative effort, National Science Foundation (NSF), (\$200,000), 2021-2022
- Co-PI: RAPID: COVID-19 Response Support: Building Synthetic Multi-scale Networks, National Science Foundation, National Science Foundation (NSF), (\$173,640), 2020-2021
- Co-PI: RAPID: Collaborative: Transfer Learning Techniques for Better Response to COVID-19 in the US, National Science Foundation (NSF), (\$25,000), 2020-2021
- Co-PI: Smart Targeting and Optimization for the Mitigation and Prevention of Influenza (STOMP-flu). Center for Disease Control and Prevention (CDC) (\$454,427), 2019-2020
- Co-PI: Network-based Mobility Modeling for Complex Humanitarian Emergencies. Global Infectious Diseases Institute, University of Virginia (\$98,750), 2019-2020
- Co-PI: AccuWeather License to Use, Market and Resell 4-Week Influenza Forecast. AccuWeather (\$55,000), 2018-2019
- Co-PI: Assessment of Invasive Alien Species Distribution in the Chitwan-Annapurna-Landscape (CHAL) Region, Nepal. United States Agency for International Development (USAID) (\$135,458), 2018-2019
- Postdoc/Key personnel: A High-resolution Interaction Based Approach to Modeling the Spread of Agricultural Invasive Species. United States Agency for International Development (USAID) (\$1,000,000), 2015-2019

Awards and Recognitions

- Recipient of the 2022 Collaborative Excellence in Public Service Award, University of Virginia, 2022
- Best Paper Award, IEEE International Conference on Big Data, 2022
- Opening Influenza Research Fellowship, co-awarded by Flu Lab and Center for Open Science, 2022
- Selected as a Scenario Modeling Consortium Fellow, 2022-2025
- Recognized among Top 50 Innovators in Intelligent Health, 2020
- Best Poster Award (Biomedical category) at the UNC Going Viral Symposium, 2018
- Runner up - BDMM2017 Hackathon, co-held with IEEE BigData 2017
- Among top three teams in NIH/NSF RAPIDD Ebola Forecasting Challenge, 2015
- Best Presentation Award at the SCINSE'14 workshop co-held with COMSNETS 2014

Book Chapters

1. L. Wang, A. Adiga, J. Chen, B. Lewis, A. Sadilek, **SV**, and M. Marathe, Title: “Combining theory and data driven approaches for epidemic forecasts”, in Knowledge-Guided Machine Learning, Chapman and Hall/CRC 55-82
2. A. Adiga, B. Lewis, S. Levin, M. Marathe, H.V. Poor, S.S. Ravi, D.J. Rosenkrantz, R.E. Stearns, **SV**, A. Vullikanti, L. Wang, “AI Techniques for Forecasting Epidemic Dynamics: Theory and Practice”, in Artificial Intelligence in COVID-19, Springer, 2022
3. A. Adiga, A. Wilson, **SV**, . . . , M. Marathe, and NSSAC-BII team, “The role of Artificial Intelligence in Epidemiological Modeling”, to be published in AI for Science, World Scientific Press (expected 2022)

Journal articles

1. E. Howerton, L. Contamin, . . . , **SV**, . . . , K. Shea, C. Viboud, and J. Lessler “Evaluation of the US COVID-19 Scenario Modeling Hub for informing pandemic response under uncertainty.”, Nature Communications 14.1 (2023): 7260. (as part of the US COVID-19 Scenario Modeling Hub)
2. B. Espinoza, A. Adiga, **SV**, A. S. Warren, . . . , S. Levin, and M. Marathe, “Coupled models of genomic surveillance and evolving pandemics with applications for timely public health interventions.”, Proceedings of the National Academy of Sciences 120, no. 48 (2023): e2305227120.
3. P. V. Prasad, M. K. Steele, C. Reed, . . . , **SV**, . . . , and M. Biggerstaff, “Multimodeling approach to evaluating the efficacy of layering pharmaceutical and nonpharmaceutical interventions for influenza pandemics”, Proceedings of the National Academy of Sciences 120.28 (2023): e2300590120.
4. K. Sherratt, H. Gruson, H. Johnson, . . . , **SV**, . . . , J. Bracher, and S. Funk, “Predictive performance of multi-model ensemble forecasts of COVID-19 across European nations”, Elife 12 (2023): e81916 (as part of EU COVID-19 Forecast Hub)
5. R. K. Borchering, L.C. Mullany, E. Howerton, . . . , **SV**, . . . , C. Viboud, and J. Lessler, “Impact of SARS-CoV-2 vaccination of children ages 5–11 years on COVID-19 disease burden and resilience to new variants in the United States, November 2021–March 2022: a multi-model study”, Lancet Regional Health-Americas 17 (2023): 100398
6. T. McAndrew, M. Majumder, A. Lover, **SV**, . . . , N. Bosse, and J. Cambeiro, “Early human judgment forecasts of human monkeypox, May 2022.”, The Lancet Digital Health 4.8 (2022): e569-e571.
7. E. Cramer, Y. Huang, Y. Wang, . . . , M. Zorn, and N. Reich, “The United States COVID-19 Forecast Hub dataset.”, Scientific Data 9.1 (2022): 1-15 (as part of US COVID-19 Forecast Hub).
8. Z. Mehrab, A. Adiga, M. Marathe, **SV**, S. Swarup, “Evaluating the Utility of High-Resolution Proximity Metrics in Predicting the Spread of COVID-19”, ACM Transactions on Spatial Algorithms and Systems, 2022
9. S. Truelove, C.P. Smith, . . . , **SV**, . . . , M. Runge, and C. Viboud, “Projected resurgence of COVID-19 in the United States in July–December 2021 resulting from the increased transmissibility of the Delta variant and faltering vaccination”, Elife 11 (2022): e73584 (as part of US COVID-19 Scenario Modeling Hub)
10. P. Bhattacharya, J. Chen, S. Hoops, D. Machi, B. Lewis, **SV**, . . . , C. Barrett, and M. Marathe. “Data-Driven Scalable Pipeline using National Agent-Based Models for Real-time Pandemic Response and Decision Support”, to appear in The International Journal of High Performance Computing Applications (IJHPCA), 2022. **(Finalist for the 2021 ACM Gordon Bell Special Prize for High Performance Computing-Based COVID-19 Research)**

11. J. Chen, A. Vullikanti, J. Santos, **SV**, . . . , C. Barrett, and A. Marathe, “*Epidemiological and Economic Impact of COVID-19 in the US*”, Scientific reports 11.1 (2021): 1-12
12. S. Pollett, M.A. Johansson, N. G. Reich, D. Brett-Major, **SV**, . . . , Oliver Brady, and C. Rivers, “*Recommended reporting items for epidemic forecasting and prediction research: the EPIFORGE 2020 guidelines*”, PLoS medicine 18.10 (2021): e1003793
13. R. K. Borchering, C. Viboud, E. Howerton, . . . **SV**, . . . , K. Shea, and J. Lessler, “*Modeling of future COVID-19 cases, hospitalizations, and deaths, by vaccination rates and nonpharmaceutical intervention scenarios—United States, April–September 2021*”, Morbidity and Mortality Weekly Report (MMWR) 70.19 (2021): 719 (as part of US COVID-19 Scenario Modeling Hub)
14. **SV**, A. Sadilek, A. Fadikar, . . . , L. Wang, and M. Marathe, “*Forecasting influenza activity using machine-learned mobility map*”, Nature Communications, 12.1 (2021): 1-12
15. A.S. Poudel, B.B. Shrestha, M.D. Joshi, R. Muniappan, A. Adiga, **SV**, and P.K. Jha, “*Predicting the current and future potential distribution of an invasive weed Ageratina adenophora in Chitwan-Annapurna Landscape, Nepal*”, Mountain Research and Development, 40.2 (2020): R61
16. A. Adiga, D. Dubhashi, B. Lewis, M. Marathe, **SV**, and A. Vullikanti, “*Mathematical Models for COVID-19 Pandemic: A Comparative Analysis*”, Journal of the Indian Institute of Science 100, 793-807 (2020)
17. A. Adiga, J. Chen, M. Marathe, H. Mortveit, **SV**, and A. Vullikanti, “*Data-Driven Modeling for Different Stages of Pandemic Response*”, Journal of the Indian Institute of Science 100, 901-915 (2020)
18. J. Chen, A. Vullikanti, S. Hoops, H. Mortveit, B. Lewis, **SV**, W. You, S. Eubank, M. Marathe, C. Barrett, and A. Marathe, “*Medical Costs of Keeping the US Economy Open During COVID-19*”, Scientific reports 10.1 (2020): 1-10
19. P. Sambaturu, P. Bhattacharya, J. Chen, B. Lewis, M. Marathe, **SV**, and A. Vullikanti, “*An automated approach for finding spatio-temporal patterns in disease spread*”, JMIR Public Health Surveill 2020;6(3):e12842
20. S. Eubank, I. Eckstrand, B. Lewis, **SV**, M. Marathe, and C. Barrett, “*Commentary on Ferguson, et al., “Impact of Non-pharmaceutical Interventions (NPIs) to Reduce COVID-19 Mortality and Healthcare Demand”*”, Bulletin of Mathematical Biology 82.4 (2020): 1-7
21. P. Telionis, **SV**, P. Corbett, and B. Lewis, “*Methods for Rapid Mobility Estimation to Support Outbreak Response*”, Health security 18.1 (2020): 1-15
22. **SV**, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. Sah, A.P. Giri, L. Colavito, Nitin S, Sridhar V, Asokan R, R. Muniappan, G. Norton, and A. Adiga, “*Modeling commodity flow in the context of invasive species spread: Study of Tuta absoluta in Nepal*”, Crop Protection 135 (2020): 104736
23. **SV**, J. Chen, A. Fadikar, S. Gupta, D. Higdon, B. Lewis, M. Marathe, H. Mortveit, and A. Vullikanti, “*Optimizing spatial allocation of seasonal influenza vaccine under temporal constraints*”, PLOS Computational Biology 15.9 (2019): e1007111
24. A. Fadikar, D. Higdon, J. Chen, B. Lewis, **SV**, and M. Marathe, “*Calibrating a Stochastic, Agent-Based Model Using Quantile-Based Emulation*”, SIAM/ASA Journal on Uncertainty Quantification 6, no. 4 (2018): 1685-1706
25. Q. F. Ying, D. M. Chiu, **SV**, and X. Zhang, “*User modeling and usage profiling based on temporal posting behavior in OSNs*”, Online Social Networks and Media 8 (2018): 32-41
26. W. Yan, **SV**, and D. M. Chiu, “*A Population Model for Academia: Case Study of the Computer Science Community using DBLP Bibliography 1960-2016*”, IEEE Transactions on Emerging Topics in Computing, 2018
27. **SV**, B. Lewis, J. Chen, D. Higdon, A. Vullikanti, and M. Marathe, “*Using data-driven agent-based models for forecasting emerging infectious diseases*”, Epidemics 22 (2018): 43-49
28. F. S. Tabataba, P. Chakraborty, N. Ramakrishnan, **SV**, J. Chen, B. Lewis, and M. Marathe, “*A Framework for Evaluating Epidemic Forecasts*”, BMC Infectious Diseases 17.1 (2017): 345
29. W. Yan, **SV**, and D. M. Chiu, “*Research collaboration and topic trends in Computer Science based on top active authors*”, PeerJ Computer Science 2 (2016): e41
30. **SV** and A. Kumar, “*Co-Evolution of Content Spread and Popularity in Mobile Opportunistic Networks*”, IEEE Transactions on Mobile Computing 13.11 (2014): 2498-2509

Conference and Workshop papers

1. A. Adiga, S. Athreya, . . . , R. Sundaresan, **SV**, and S. Yasodharan, “*A Multi-Team Multi-Model Collaborative COVID-19 Forecasting Hub for India*”, Winter Simulation Conference (WinterSim) 2023
2. Z. Mehrab, L. Stundal, **SV**, . . . , D. Leblang, R. Colwell, M. Marathe, “*A Generalizable Theory-driven Agent-based Framework to Study Conflict-induced Forced Migration*”, The Thirty-Sixth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-24)
3. A. Adiga, S. Singh, . . . , **SV**, M. Marathe, and A. Adiga, “*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, at AAAI 2023
4. A. Adiga, G. Kaur, L. Wang, B. Hurt, P. Porebski, **SV**, B. Lewis, and M. Marathe, “*Phase-Informed Bayesian Ensemble Models Improve Performance of COVID-19 Forecasts*”, The Thirty-Fifth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-23)
5. A. Adiga, G. Kaur, L. Wang, B. Hurt, P. Porebski, **SV**, B. Lewis, and M. Marathe, “*Enhancing COVID-19 Ensemble Forecasting Model Performance Using Auxiliary Data Sources*”, 2022 IEEE International Conference on Big Data (IEEE BigData 2022) (**Best Paper Award**)
6. J. Chen, S. Hoops, A. Marathe, H. Mortveit, B. Lewis, **SV**, . . . , C. Barrett, and M. Marathe, “*Effective Social Network-Based Allocation of COVID-19 Vaccines*”, In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (pp. 4675-4683)
7. R. Rajuladevi, M. Marathe, P. Porebski, **SV**, “*Impact of Seeding and Spatial Heterogeneity on Metapopulation Disease Dynamics*”, epiDAMIK 5.0: The 5th International workshop on Epidemiology meets Data Mining and Knowledge discovery at KDD 2022
8. L. Wang, A. Adiga, J. Chen, A. Sadilek, **SV**, M. Marathe, “*CausalGNN: Causal-Based Graph Neural Networks for Spatio-Temporal Epidemic Forecasting*”, Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI-22), 2022
9. P. Bhattacharya, D. Machi, J. Chen, S. Hoops, B. Lewis, H. Mortveit, **SV**, . . . , C. Barrett, and M. Marathe, “*AI-Driven Agent-Based Models to Study the Role of Vaccine Acceptance in Controlling COVID-19 Spread in the US*”, IEEE International Conference on Big Data (IEEE BigData), 2021
10. S. Hoops, J. Chen, A. Adiga, et al., “*A Scalable Agent-Based Modeling Framework to Study Realistic Contact Tracing Protocols*”, Winter Simulation Conference (WSC), 2021
11. A. Adiga, L. Wang, B. Hurt, A. S. Peddireddy, P. Porebski, **SV**, B. Lewis, and M. Marathe “*All Models Are Useful: Bayesian Ensembling for Robust High Resolution COVID-19 Forecasting*”, ACM SIGKDD Conference on Knowledge Discovery & Data Mining, 2021
12. A. Talekar, N. Vaidhiyan, S. Shriram, G. Aggarwal, J. Chen, **SV**, L. Wang, A. Adiga, A. Sadilek, A. Tendulkar, M. Marathe, R. Sundaresan and M. Tambe, “*Cohorting to isolate asymptomatic spreaders: An agent-based simulation study on the Mumbai Suburban Railway*”, extended abstract at International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2021
13. D. Machi, P. Bhattacharya, S. Hoops, J. Chen, H. Mortveit, **SV**, B. Lewis, M. Wilson, A. Fadikar, T. Maiden, C. L. Barrett, M. V. Marathe, “*Scalable Epidemiological Workflows to Support COVID-19 Planning and Response*”, IEEE International Parallel & Distributed Processing Symposium (IPDPS), 2021
14. L. Wang, A. Adiga, A. Sadilek, A. Tendulkar, **SV**, A. Vullikanti, G. Aggarwal, A. Talekar, J. Chen, B. Lewis, S. Swarup, A. Kapoor, M. Tambe, and M. Marathe, “*Using Mobility Data to Understand and Forecast COVID19 Dynamics*”, AI for Social Good Workshop, International Joint Conference on Artificial Intelligence (IJCAI), 2020
15. L. Wang, A. Adiga, **SV**, J. Chen, B. Lewis, and M. Marathe, “*Examining Deep Learning Models with Multiple Data Sources for COVID-19 Forecasting*”, IEEE BigData Workshop on Data Science in Medicine and Healthcare (DSMH), 2020
16. A. S. Peddireddy, D. Xie, P. Patil, M. Wilson, D. Machi, **SV**, B. Klahn, P. Porebski, P. Bhattacharya, S. Dumbre, E. Raymond, and M. Marathe, “*From 5Vs to 6Cs: Operationalizing Epidemic Data Management with COVID-19 Surveillance*”, IEEE International Conference on Big Data (IEEE BigData), 2020
17. A. Adiga, S. Singh, E. Choo, **SV**, M. Marathe, P. Jha, S. Dhakal, K. Poudel, B. B. Shreshta, R. Muniappan, S. Mahajan, A. Devkota, A. Adiga, “*A Deep Learning Framework for Invasive Species Mapping using High-Resolution Satellite Imagery*”, ASPRS Annual Conference, 2020

18. P. Sambaturu, B. Adhikari, B. A. Prakash, **SV**, and A. Vullikanti, “*Designing Near-Optimal Temporal Interventions to Contain Epidemics*”, International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS), 2020
19. A. Adiga, **SV**, S. Wu, M. Marathe, S. Eubank, L. P. Sah, A. P. Giri, L. Colavito, R. Muniappan, “*Understanding the Role of Seasonal Food Trade Networks in Invasive Species Spread*”, SIAM Workshop of Network Science, 2019
20. M. Nath, **SV**, B. Kaperick, S. Eubank, M. Marathe, A. Marathe, and A. Adiga, “*Using Network Reliability to Understand International Food Trade Dynamics*”, Complex Networks, 2018
21. Q. F. Ying, D. M. Chiu, **SV**, and X. Zhang, “*Profiling OSN Users Based on Temporal Posting Patterns*”, WWW ’18 Companion Proceedings of the The Web Conference, 2018
22. **SV**, S. Wu, B. Shi, A. Marathe, M. Marathe, S. Eubank, L. P. Sah, A. P. Giri, L. Colavito, Nitin S, Sridhar V, Asokan R, R. Muniappan, G. Norton, and A. Adiga, “*Towards Robust Models of Food Flows and Their Role in Invasive Species Spread*”, IEEE International Conference on Big Data (IEEE Big Data), 2017
23. F. S. Tabataba, M. Hosseinipour, B. Lewis, F. S. Tabataba, **SV**, D. Higdon, J. Chen, and M. Marathe, “*Epidemic Forecasting by Combining Agent-Based Models and Smart Beam-Particle Filtering Framework*”, IEEE International Conference on Data Mining (ICDM), 2017
24. **SV**, J. Chen, S. Gupta, B. Lewis, M. Marathe, H. Mortveit, and A. Vullikanti, “*Spatio-temporal optimization of seasonal vaccination using a metapopulation model of influenza*”, IEEE International Conference on Healthcare Informatics (ICHI), 2017
25. **SV**, A. Marathe, S. Eubank, M. Marathe, A. Adiga “*Hybrid models for ecological and anthropogenic drivers of pest invasion: Case study of Tuta Absoluta in Nepal*”, International Conference on Biodiversity, Climate Change Assessment and Impacts on Livelihood (ICBCL), 2017
26. W. Yan, **SV**, and D. M. Chiu, “*Get To the Top and Stay There: A Study of Citation Rank Dynamics in Academia*”, International Conference Companion on World Wide Web (BigScholar), 2016
27. A. Adiga, **SV**, and A. Vullikanti, “*To delay or not: Temporal Vaccination Games on Networks*”, IEEE International Conference on Computer Communications (INFOCOM), 2016
28. W. Yan, **SV**, and D. M. Chiu, “*Research Collaboration and Topic Trends in Computer Science - An Analysis Based on UCP Authors*”, International Conference Companion on World Wide Web (SAVE-SD), 2015
29. Q. F. Ying, **SV**, and D. M. Chiu, “*Modeling and Analysis of Scholar Mobility on Scientific Landscape*”, International Conference Companion on World Wide Web (BigScholar), 2015
30. **SV** and A. Kumar, “*Competition for Content Spread over Multiple Social Networks*”, Workshop on Social Networks in Science and Engineering (SCINSE’14), co-held with COMSNETS 2014 (Best Presentation Award)
31. E. Altman, P. Kumar, **SV**, and A. Kumar, “*Competition over Timeline in Social Networks*”, Workshop on Social Network Analysis and Algorithms (SNAA), co-held with IEEE/ACM ASONAM 2013
32. **SV** and A. Kumar, “*Co-evolution of Content Popularity and Delivery in Mobile P2P Networks*”, IEEE International Conference on Computer Communications (INFOCOM), 2012
33. **SV** and A. Kumar, “*Information Dissemination in Socially Aware Networks under the Linear Threshold model*”, National Conference on Communication (NCC), 2011

Technical Reports and Preprints

1. S. Jung, S. L. Loo, E. Howerton, . . . , **SV**, . . . , S. Truelove, C. Viboud, and J. Lessler, “*Potential impact of annual vaccination with reformulated COVID-19 vaccines: lessons from the U.S. COVID-19 Scenario Modeling Hub*”, medRxiv, 2023 (as part of US COVID-19 Scenario Modeling Hub)
2. V. Lopez, E. Y. Cramer, . . . , **SV**, . . . , M. Biggerstaff, N. G. Reich, and M. Johansson, “*Challenges of COVID-19 Case Forecasting in the US, 2020-2021*”, medRxiv, 2023 (as part of US COVID-19 Forecast Hub)
3. M. C. Runge, K. Shea, E. Howerton, K. Yan, H. Hochheiser, E. Rosenstrom, W. J. M. Probert, R. Borchering, M. V. Marathe, B. Lewis, **SV**, S. Truelove, J. Lessler, C. Viboud, “*Scenario Design for Infectious Disease Projections: Integrating Concepts from Decision Analysis and Experimental Design*”, medRxiv, 2023
4. **SV**, J. Cambeiro, T. Liptay, B. Lewis, M. Orr, G. Dempsey, A. Telionis, J. Crow, C. Barrett, and M. Marathe, “*Utility of human judgment ensembles during times of pandemic uncertainty: A case study during the COVID-19 Omicron BA.1 wave in the USA*”, medRxiv, 2022

5. A. Adiga, S. Athreya, M. Marathe, J. Midthala, N. Rathod, R. Sundaresan, **SV**, and S. Yasodharan, “*Impact of weeknight and weekend curfews using mobility data: A case study of Bengaluru Urban*”, medRxiv, 2022
6. A. Pilehvari, W. You, J. Chen, J. Krulick, S. Venkatramanan, and A. Marathe, “*Differential Impact of Social Distancing on COVID-19 Spread in the U.S.: By Rurality and Social Vulnerability*”, Research Square 2021
7. A. Adiga, S. Athreya, B. Lewis, M. Marathe, N. Rathod, R. Sundaresan, S. Swarup, **SV**, and S. Yasodharan, “*Strategies to Mitigate COVID-19 Resurgence Assuming Immunity Waning: A Study for Karnataka, India*”, medRxiv, 2021
8. J. Chen, S. Hoops, A. Marathe, H. Mortveit, B. Lewis, **SV**, A. Haddadan, . . . , C. Barrett, and M. Marathe “*Prioritizing allocation of COVID-19 vaccines based on social contacts increases vaccination effectiveness*”, medRxiv, 2021
9. Z. Mehrab, A. G. Ranga, D. Sarkar, **SV**, Y. Chungbaek, S. Swarup, and M. Marathe “*High resolution proximity statistics as early warning for US universities reopening during COVID-19*”, medRxiv, 2020
10. N. Wu, X. Ben, B. Green, K. Rough, **SV**, M. Marathe, P. Eastham, A. Sadilek, and S. O’Banion, “*Predicting Onset of COVID-19 with Mobility-Augmented SEIR model*”, medRxiv, 2020.
11. A. Adiga, L. Wang, A. Sadilek, A. Tendulkar, **SV**, A. Vullikanti, G. Aggarwal, A. Talekar, X. Ben, J. Chen, B. Lewis, S. Swarup, M. Tambe, and M. Marathe, “*Interplay of global multi-scale human mobility, social distancing, government interventions, and COVID-19 dynamics*”, medRxiv, 2020.
12. A. Adiga, **SV**, J. Schlitt, . . . , M. Marathe, and C. Barrett, “*Evaluating the impact of international airline suspensions on the early global spread of COVID-19*”, medRxiv, 2020
13. E. A. Heinrichs, J. Sidhu, R. Muniappan, A. Fayad, A. Adiga, A. Marathe, J. Mcnitt, and **SV**, “*Pest Risk Assessment of the Fall Armyworm, Spodoptera frugiperda in Egypt*”, Feed the Future Innovation Lab for Integrated Pest Management Technical Report, 2017
14. **SV** and A. Kumar, “*Influence Spread in Social Networks: A Study via a Fluid Limit of the Linear Threshold Model*”, arXiv:1405.7096 (2014)
15. **SV** and A. Kumar, “*New Insights from an Analysis of Social Influence Networks under the Linear Threshold model*”, arXiv:1002.1335 (2010)

Invited Talks and Posters

1. “*Wastewater surveillance for COVID-19 forecasting: Promises and Pitfalls*, Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, September 2023
2. G. Kaur, A. Adiga, B. Hurt, B. Klahn, C. Chen, A. Warren, **SV**, B. Lewis, and M. Marathe, “*Interplay and predictive power of COVID-19 incidence indicators in Virginia*”, poster at the Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, September 2023
3. Z. Mehrab, B. Lewis, **SV**, J. Crow, A. Telionis, D. Kim, M. Wilson, G. Harrison, S. Spillman, and M. Marathe, “*Data-driven approaches for maximizing social equity of public health outbreak response*, 2023 CSTE Annual Conference, Salt Lake City, June 2023
4. **SV**, J. Cambeiro, B. Lewis, M. Orr, G. Dempsey, A. Telionis, J. Crow, C. Barrett, and M. Marathe, “*Utility of human judgment ensembles during times of pandemic uncertainty*”, presented at the 2023 CSTE Annual Conference (Salt Lake City) and the International Symposium on Forecasting (Charlottesville), June 2023
5. B. Lewis, P. Porebski, **SV**, A. Adiga, B. Hurt, B. Klahn, G. Kaur, A. Warren, J. Crow, and M. Marathe, “*Integrating Modeling and Outbreak Analytics into Public Health Practice, the Virginia Experience*”, 2023 CSTE Annual Conference, Salt Lake City, June 2023
6. N. C. Mandal, A. Adiga, G. Kaur, **SV**, B. Lewis, and M. Marathe, “*An Exploration of Trained Ensemble Models for Epidemic Forecasting Based on Interval Scores*”, International Symposium on Forecasting (Charlottesville), June 2023
7. L. Zhang, **SV**, “*Methods based on Optimal Transport for Evaluation, Explanation, and Ensembling of Epidemic Forecasts (MOTEEF)*”, International Symposium on Forecasting (Charlottesville), June 2023
8. “*Extracting Categorical Indicators from Epidemiological Timeseries*”, presentation and tool demo at the 2023 CSTE Annual Conference - Infectious Disease Forecasting Workshop, Salt Lake City, June 2023
9. “*Chasing the pandemic: Computation models in the fight against COVID-19*”, Caritas Institute of Higher Education, Hong Kong, January 2023

10. “Phase-Informed Ensemble Model Training for Enhancing Forecasting Performance”, poster at the Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, October 2022
11. “Integrating Human Judgment systems with Computational models for Epidemics”, talk given at Virginia Department of Health, May 2022
12. J. Chen, B. Lewis, M. Marathe, E. Raymond, **SV**, “National Data Driven Multi-scale Multi-agent models for real-time pandemic science”, poster presented at the NACCHO Preparedness Summit, April 2022
13. “Computational Modeling and Data Strategies for Predicting and Responding to Pandemics”, Intelligent Health Inspired Summit, May 2020
14. “Estimating Global direct importation risk for COVID-19”, Pandemic Prediction and Forecasting Science & Technology workgroup, Feb 2020
15. P. Corbett, **SV**, B. Lewis, “CDC Aedes Forecasting Challenge: Historical Average and Ecological Niche Modeling”, Vector-borne disease forecasting workshop, Feb 2020
16. **SV**, L. Wang, A. Fadikar, B. Lewis, J. Chen, H. Carscadden, P. Sambaturu, A. Vullikanti, and M. Marathe “Multi-model Multi-target Approaches for Forecasting Seasonal Influenza in the United States”, CSTE/CDC Seasonal Influenza Forecasting Workshop, Aug 2019
17. “Computing for Health: In silico approaches for health sciences”, IISc. Bangalore, Jan 2019
18. **SV**, J. Chen, A. Fadikar, B. Lewis, M. Marathe, S. Gupta, H. Mortveit, and A. Vullikanti “Exploring optimal vaccine allocation using a national model of influenza”, UNC Going Viral Symposium, Apr 2018 (Best poster award)
19. “iFlu, e-Flu: where from and where to?”, Virginia Tech Schiffert Health Center, Mar 2018
20. “Resource optimization problems using a mathematical model of influenza”, 6th Annual MIDAS Outreach Conference, Harvard T.H. Chan School of Public Health, Nov 2017
21. **SV**, 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”, poster presented at KDD 2016 Workshop on Data Science for Food, Energy and Water, 2016
22. “Modeling in the Time of Ebola: Using HPC Simulations to Understand Infectious Disease Dynamics”, IISc. Bangalore and IIT Madras, Feb 2016
23. “Ebola Forecasting Challenge: Team Virginia Tech”, NIH/RAPIDD Ebola Forecasting Challenge workshop, Feb 2016
24. **SV**, J. Chen, B. Lewis, A. Vullikanti, and M. Marathe, “Calibration and Forecasting Framework for Infectious Diseases”, International Symposium for Next Generation Infrastructure (ISNGI), Sep 2015
25. “Delay-Cost Optimal Coupon Delivery in Mobile Opportunistic Networks”, High Dimensional Network Analytics Workshop, IISc. Bangalore, Dec 2013
26. **SV** and A. Kumar, “Influence Spread in Social Networks”, TechVista - Microsoft Research India, Jan 2010

Community Activities

- Track Chair, ANNSIM 2024 - Health & Medicine
- NIH Study Section: Special Emphasis Panel, Office of Data Sciences and Emerging Technologies, November 2022
- Guest Editor, Epidemics Special Issue on Scenario Modeling Hub
- Co-organizer, Indo-US virtual workshop on Next Generation of STEM Scientists (NGSS), August 2022
- AAMAS 2021 tutorial on Multi-agent systems for COVID-19 and future pandemics
- Grant Reviewer: NIH MIDAS COVID-19 Modeling Urgent Grant New Initiatives
- NIH Study Section: Special Emphasis Panel 2021/01 ZRG1 PSE N90 (COVID-19: epidemiology and analytics)
- Organizing Committee, NSF VO on Pandemic Research for Preparedness & Resilience (PREPARE) Kickoff Workshop, December 2020
- Co-organizer: epiDAMIK 3.0: The 3rd International workshop on Epidemiology meets Data Mining and Knowledge discovery, coheld with SIGKDD 2020
- Delphi Panel member for Epidemic Forecasting Reporting Guidelines (EPI-FORGE), January 2020
- TPC Member: COMSNETS (2015, 2016), IJCAI (2020, 2021, 2022, 2023), AAMAS (2021, 2022, 2024), AAAI (2021,2022, 2023, 2024), ICMLA (2021,2022,2023), ANNSIM’21

- Journal Reviewer: PNAS, PLOS Computational Biology, Nature Communications Medicine, Nature Scientific Reports, Nature Human Behavior, JAMA Open, Epidemiology & Infection, Epidemics, Vaccine, American Journal of Tropical Medicine & Hygiene, PLOS Currents: Outbreaks, Health Security, Health Affairs, Journal of Theoretical Biology, Physica A, PLOS One, BMJ Open, F1000, Frontiers, Frontiers PH, Ecological Informatics, Ecological Modeling, Simulation Modeling Practice & Theory, Applied Soft Computing, Transactions on Mobile Computing, Transactions on Information Theory, Theoretical Computer Science, Artificial Intelligence Review, Journal of the Indian Institute of Science, Journal of The Royal Society Interface
- Local Organizing Committee, ICTS School and Workshop on Network Science in EECS, IISc. Bangalore, 2012

Outreach and Press Mentions

- Panelist on “Data Sharing” at Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, September 2023
- *“Innovative Professional Workshops Revolutionize Pedagogical Approaches for the Next Generation”*, SIAM News, 28 Nov 2022
- *“Will We Get Omicron’d Again?”*, The Atlantic, 10 Nov 2022
- *“Warning Signs About the First Post-pandemic Winter”*, The Atlantic, 5 Oct 2022
- Panelist, Bridging the gap between CS/ML work and public health practice, at epiDAMIK 5.0, held in conjunction with ACM SIGKDD 2022
- *“California, With Strict Mandates, Has More COVID Cases Than Florida, Texas—Here’s Why”*, Newsweek, 11 Nov 2021
- Panelist, *“A Metaculus Open Panel Discussion: How Forecasts Inform COVID-19 Policy”*, Metaculus, 5 Oct 2021
- *“When Will Delta Variant Peak? Winter Uncertain As COVID Cases Drop in U.S.”*, Newsweek, 27 Sep 2021
- *“University of Virginia scientists wield statistics to prep for coronavirus’ next moves”*, The Virginian Pilot, 5 Sep 2021
- *“Biocomplexity Institute’s COVID-19 model projects peak in cases during first week of classes”*, The Cavalier Daily, 19 Aug 2021
- Podcast co-host: COVIDChasers (a retrospective of COVID-19 response from UVA BII)
- Podcast co-host: Science Before the Storm (supported by NSF as part of the PREPARE Virtual Organization)
- *“UVA Biocomplexity Institute modeling COVID-19 impacts in Virginia”*, CBS19 News, 22 Dec 2020
- *“Flattening the Curve”*, Mini Med School Special Podcast: COVID-19 Charlottesville, 24 Jun 2020
- Panelist, *“Rural Populations and Infectious Disease Transmission: Implications for COVID-19”*, George Mason University, 9 Jun 2020
- *“Networked Epidemiology for COVID-19”*, SIAM News, 1 Jun 2020
- *“Modeling the Spread of Epidemics”*, The Pragati Podcast, 25 Mar 2020
- Panelist, *“Batten Hour: Multidisciplinary perspectives on the coronavirus”*, UVA Batten School of Leadership & Public Policy, 24 Feb 2020
- *“To predict Flu’s spread, modelers turn to weather forecasts”*, UVA Today, 18 Feb 2020
- *“Using weather forecasts to predict flu activity”*, AccuWeather Press, 28 Jan 2020
- *“Researchers utilize holistic approach to predict severity of influenza season”*, Cavalier Daily, 16 Jan 2020
- *“UVA Researchers Harnessing Big Data’s Power to Fight the Flu”*, UVA Today, 25 Oct 2019
- *“Modelling epidemics: the maths behind disease outbreaks”*, Elsevier, Feb 2019
- *“Researchers at Virginia Tech’s Biocomplexity Institute work to forecast flu”*, Collegiate Times, 19 Feb 2018
- *“Virginia Tech flu forecasting technology to be used by AccuWeather”*, WSLS10, 6 Dec 2017

Mentoring

Graduate students

- Ajay Sanjeevan (2023) - Masters
Project: Phase-based Epidemic Time series Analyzer (PEpiTA)
- Akhil Peddireddy (2019-20) - Masters (co-advisor)
Thesis: Real-time epidemic surveillance management for supporting COVID-19 response workflows

Undergraduate students

- Lanyin Zhang (Summer 2022-now) - Quantifying epidemic forecast diversity and change through optimal transport
- Jeremy Nachison (Summer 2022-now) - A Multi-Scale Model for Viral Dynamics Across a Population
- Rohit S.Rajuladevi (Summer 2021-now) - Spatiotemporal models for epidemic dynamics
- Wright Quist (Summer 2023) - Predicting epidemic cascades using metapopulation models
- Andrew Murphy (Summer 2019) - Hierarchical seasonal autoregressive models for influenza forecasting
- Patrick Corbett (Spring 2019) - Forecasting *Aedes* mosquito abundance in United States
- Ethan Ludwick (Summer 2018) - Machine learning and satellite imagery to map *C. odorata* in Nepal
- Kingsley Nwosu Jr. (Summer 2017) - Computational methods for stockpile allocation during epidemics
- Asia Taylor (Summer 2017) - Assessing the resolution of Influenza surveillance datasets in the US