SRINIVASAN (SRINI) VENKATRAMANAN

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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

Public Health Support

- CDC FluSight Influenza Forecasting, 2016-19, 2021-now
- CDC-supported COVID-19 Forecast Hub, 2020-23
- CDC-supported Scenario Modeling Hub (COVID-19, Influenza, RSV), 2020-now
- Tridemic (COVID-19, Influenza, RSV) in the United States - modeling & forecasting, DTRA, 2022
- COVID-19 Response Support, Karnataka Technical Advisory Committee (in collaboration with Indian Institute of Science), 2020-21
- COVID-19 Response Support, Virginia Departments of Health (VDH), Education (VDoE) and Emergency Management (VDEM), 2020-23
- COVID-19 Response Support, Defense Threat Reduction Agency (DTRA), 2020-21
- Influenza Forecasting Challenge, Armed Forces Health Services Branch (AFHSB), 2018-19
- Ebola outbreak response in Central Africa (DRC), DTRA for US AFRICOM, 2018-19
- Ross River Virus response in Australia, DTRA for US PACOM, 2018
- Pest Risk Assessment, Fall Army Worm, Egypt, 2017-18
- Pest Risk Assessment, Tomato leafminer, Nepal, 2016-17
- Seasonal influenza vaccine allocation planning, DTRA for US NORTHCOM, 2016-17

Open data and software

- Phase-based Epidemic Time series Analyzer (PEpiTA), `https://github.com/NSSAC/PEpiTA` interactive version available online at `https://pepita.pods.uvarc.io/`
- PatchSim, Metapopulation SEIR simulation engine, `https://github.com/NSSAC/PatchSim`
- PatchFlow, Synthetic flow data for PatchSim, `https://github.com/NSSAC/patchflow-data/`
- Flight cancellations related to 2019-nCoV (COVID-19), University of Virginia Dataverse `https://doi.org/10.18130/V3/Z6524P`

Book Chapters

3. 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, 2022
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
1. 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, 2022

Journal articles

39. C. Chen, G. Kaur, A. Adiga, B. Espinoza, **SV**, ..., M. Marathe, *"Wastewater-based Epidemiology for COVID-19 Surveillance: A Survey"*, Epidemics, Volume 49, 2024, 100793
38. S. Mathis, A. Webber, ..., **SV**, ..., M. Biggerstaff, R. Borchering, *"Evaluation of FluSight influenza forecasting in the 2021-22 and 2022-23 seasons with a new target laboratory-confirmed influenza hospitalizations"*, Nature Communications 15.1 (2024): 6289
37. M. C. Runge, K. Shea, E. Howerton, ..., **SV**, S. Truelove, J. Lessler, C. Viboud, *"Scenario Design for Infectious Disease Projections: Integrating Concepts from Decision Analysis and Experimental Design."* Epidemics (2024): 100775
36. J. Chen, P. Bhattacharya, S. Hoops, D. Machi, A. Adiga, H. Mortveit, **SV**, B. Lewis, and M. Marathe, *"Role of heterogeneity: National scale data-driven agent-based modeling for the US COVID-19 Scenario Modeling Hub"*, Epidemics 48 (2024): 100779
35. P. Bhattacharya , D. Machi , J. Chen , S. Hoops , B. Lewis , H. Mortveit, **SV** , ... , C. Barrett, M. Marathe, *"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 191 (2024): 104899
34. P. Porebski, **SV**, A. Adiga, B. Klahn, ..., B. Lewis, *"Data-driven mechanistic framework with stratified immunity and effective transmissibility for COVID-19 scenario projections."*, Epidemics, 47, 100761 (2024)
33. 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"*, PLoS computational biology 20.5 (2024): e1011200
32. 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"*, Plos Medicine 21.4 (2024): e1004387
31. Z. Mehrab, L. Stundal, **SV**, ..., D. Leblang, R. Colwell, and M. Marathe, *"An Agent-based framework to study forced migration: A case study of Ukraine*, PNAS Nexus, Volume 3, Issue 3, March 2024, pg80
30. 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
29. 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.
28. 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. (as part of CDC FluCode)
27. 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)

26. 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

25. 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.

24. 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).

23. 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

22. 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)

21. 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**)

20. 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

19. S. Pollett, M.A. Johannson, 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

18. 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)

17. **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

16. 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

15. 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)

14. 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)

13. 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

12. 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

11. 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

10. P. Telionis, **SV**, P. Corbett, and B. Lewis, *"Methods for Rapid Mobility Estimation to Support Outbreak Response"*, Health security 18.1 (2020): 1-15
9. **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
8. **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
7. 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
6. 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
5. 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
4. **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
3. 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
2. 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
1. **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

36. S. A. Moon, J. Chen, ..., **SV**, A. Vullikanti, A. Warren, *"Agent-Based Simulation Framework for Multi-Variant Surveillance"*, Winter Simulation Conference (WSC 2024)
35. J. Nachison, **SV**, *"VISHN: Viral Load and Immunity Simulation on a Host Network"*, Annual Modeling and Simulation Conference (ANNSIM 2024)
34. Z. Mehrab, L. Stundal, S. Swarup, **SV**, ..., D. A. Leblang, R. Colwell, and M. Marathe, *"Network Agency: An Agent-based Model of Forced Migration from Ukraine*, The 23rd International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2024)
33. 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)
32. Z. Mehrab, L. Stundal, **SV**, ..., D. Leblang, R. Colwell, and 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)
31. 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 co-held with AAAI 2023
30. 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)
29. 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)**

28. 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)

27. 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

26. 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

25. 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

24. 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

23. 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

22. 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

21. 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

20. 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

19. 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

18. 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

16. 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

15. 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

14. 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

13. 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

12. **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
11. 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
10. **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
9. **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
8. 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
7. A. Adiga, **SV**, and A. Vullikanti, *"To delay or not: Temporal Vaccination Games on Networks"*, IEEE International Conference on Computer Communications (INFOCOM), 2016
6. 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
5. 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
4. **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)
3. 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
2. **SV** and A. Kumar, *"Co-evolution of Content Popularity and Delivery in Mobile P2P Networks"*, IEEE International Conference on Computer Communications (INFOCOM), 2012
1. **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

13. T. McAndrew, M. S. Majumder, A. A. Lover, **SV**, . . . , N. I. Bosse, J. Cambeiro, and D. Braun, *"Assessing Human Judgment Forecasts in the Rapid Spread of the Mpox Outbreak: Insights and Challenges for Pandemic Preparedness"*, arXiv:2404.14686, 2024
12. **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
11. 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
10. 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
9. 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
7. 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
6. 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.
5. 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.
4. 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
3. 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
2. **SV** and A. Kumar, *"Influence Spread in Social Networks: A Study via a Fluid Limit of the Linear Threshold Model"*, arXiv:1405.7096 (2014)
1. **SV** and A. Kumar, *"New Insights from an Analysis of Social Influence Networks under the Linear Threshold model"*, arXiv:1002.1335 (2010)

Contributed/Invited Talks and Posters

30. J. Crow, C. Price, M. Marathe, B. Lewis, **SV**, and A. Telionis, *"Forecasting the COVID-19 Pandemic in Virginia: After Action Report"*, 2024 CSTE Annual Conference, Pittsburgh, June 2024
29. A. Warren, P. Bhattacharya, M. Orr, **SV**, B. Lewis, M. Marathe, J. Crain, J. Crow, A. Telionis, L. Fink, and A. Lorentz, *"Right Sizing Variant Prevalence Analysis Frames"*, 2024 CSTE Annual Conference, Pittsburgh, June 2024
28. G. Kaur, A. Adiga, B. Hurt, ..., **SV**, B. Lewis, and M. Marathe, *"Analyzing the Relationship between Wastewater and COVID-19 Signals in Virginia: A Forecasting Perspective"*, 2024 CSTE Annual Conference, Pittsburgh, June 2024
27. L. Critchley, B. Hurt, G. Kaur, ..., **SV**, B. Lewis, and M. Marathe, *"Categorically Speaking: Lessons Learned from Communicating Epidemic Activity Levels and Trends in Virginia"*, 2024 CSTE Annual Conference, Pittsburgh, June 2024
26. R. K. Borchering, J. Davis, S. Mathis, ..., M. Marathe, **SV**, and M. Biggerstaff, *"Forecasting Trends in Influenza Hospitalizations: Describing an Experimental Approach deployed during the 2022-23 Influenza Season"*, poster presented at Epidemics 2023
25. *"Wastewater surveillance for COVID-19 forecasting: Promises and Pitfalls*, invited talk at Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, September 2023
24. 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
23. 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 respone*, 2023 CSTE Annual Conference, Salt Lake City, June 2023
22. **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

21. 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
20. 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
19. L. Zhang, **SV**, *"Methods based on Optimal Transport for Evaluation, Explanation, and Ensembling of Epidemic Forecasts (MOTEEF)"*, International Symposium on Forecasting (Charlottesville), June 2023
18. *"Chasing the pandemic: Computation models in the fight against COVID-19"*, Caritas Institute of Higher Education, Hong Kong, January 2023
17. *"Phase-Informed Ensemble Model Training for Enhancing Forecasting Performance"*, poster at the Annual CSTE/CDC Infectious Disease Forecasting Workshop, Atlanta, October 2022
16. *"Integrating Human Judgment systems with Computational models for Epidemics"*, talk given at Virginia Department of Health, May 2022
15. 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
14. *"Computational Modeling and Data Strategies for Predicting and Responding to Pandemics"*, Intelligent Health Inspired Summit, May 2020
13. *"Estimating Global direct importation risk for COVID-19"*, Pandemic Prediction and Forecasting Science & Technology workgroup, Feb 2020
12. P. Corbett, **SV**, B. Lewis, *"CDC Aedes Forecasting Challenge: Historical Average and Ecological Niche Modeling"*, Vector-borne disease forecasting workshop, Feb 2020
11. **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
10. *"Computing for Health: In silico approaches for health sciences"*, IISc. Bangalore, Jan 2019
9. **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)
8. *"iFlu, e-Flu: where from and where to?"*, Virginia Tech Schiffert Health Center, Mar 2018
7. *"Resource optimization problems using a mathematical model of influenza"*, 6th Annual MIDAS Outreach Conference, Harvard T.H. Chan School of Public Health, Nov 2017
6. **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
5. *"Modeling in the Time of Ebola: Using HPC Simulations to Understand Infectious Disease Dynamics"*, IISc. Bangalore and IIT Madras, Feb 2016
4. *"Ebola Forecasting Challenge: Team Virginia Tech"*, NIH/RAPIDD Ebola Forecasting Challenge workshop, Feb 2016
3. **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
2. *"Delay-Cost Optimal Coupon Delivery in Mobile Opportunistic Networks"*, High Dimensional Network Analytics Workshop, IISc. Bangalore, Dec 2013
1. **SV** and A. Kumar, *"Influence Spread in Social Networks"*, TechVista - Microsoft Research India, Jan 2010

Reviewing

- Guest Editor, Epidemics Special Issue on Scenario Modeling Hub
- Track Chair, ANNSIM 2024 - Health & Medicine
- NIH Study Section: Special Emphasis Panel, Office of Data Sciences and Emerging Technologies, November 2022
- 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)
- 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, Americal 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

Training

- Modeling and Simulation Training using EXCEADS platform, Defense Threat Reduction Agency, September 2024
- Mentor, CSTE Peer-to-Peer group on Wastewater Surveillance, April-July 2024
- *"Extracting Categorical Indicators from Epidemiological Timeseries"*, presentation and tool demonstration at the 2023 CSTE Annual Conference - Infectious Disease Forecasting Workshop, Salt Lake City, June 2023
- Tutorial on Multi-agent systems for COVID-19 and future pandemics, AAMAS 2021
- Modeling and Simulation Training using SIBEL platform, Defense Threat Reduction Agency, September 2017

Community Activities

- Organizing Committee, 2024 Annual CSTE-CDC Infectious Disease Forecasting & Modeling Workshop, November 2024
- Co-organizer, Indo-US virtual workshop on Next Generation of STEM Scientists (NGSS), August 2022
- 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
- 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, Sep 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

- Jeremy Nachison (2024 - now)
  Project: Measures of predictability in metapopulation epidemic dynamics
- 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

- Jeremy Nachison (2022-24) - A Multi-Scale Model for Viral Dynamics Across a Population
- Lanyin Zhang (2022-23) - Quantifying epidemic forecast diversity and change through optimal transport
- Rohit S.Rajuladevi (2021-23) - 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