

Pratha Sah

Curriculum Vitae

Research expertise

Data science, computational biology, mathematical and statistical modeling, epidemiology, public health and network analysis.

Work experience

- 2017-current Postdoctoral associate: Center for Infectious Disease Modeling and Analysis, Yale School of Public Health, Yale University
- 2012-2017 Computational biology and data science research, Georgetown University
- 2011-2012 Research assistant: Population Biology Laboratory, Indian Institute of Science Education and Research (IISER), Pune, India

Peer reviewed publications

- 2019 **Sah, Pratha**, Jorge A Alfaro-Murillo, Meagan C Fitzpatrick, Kathleen M Neuzil, Lauren A Meyers, Burton H Singer, Alison P Galvani. Future epidemiological and economic impacts of universal influenza vaccines. *Proceedings of the National Academy of Sciences*, 201909613.
- 2019 **Sah, Pratha**, Jose David Mendez, and Shweta Bansal. A multi-species repository of social networks. *Scientific Data*, 6(1), 44.
- 2018 **Sah, Pratha**, Jan Medlock, Meagan C. Fitzpatrick, Burton H. Singer, and Alison P. Galvani. Optimizing the impact of low-efficacy influenza vaccines. *Proceedings of the National Academy of Sciences*, 115(20), 5151-5156.
- 2018 Reyes, Olivia, Elizabeth C. Lee, **Pratha Sah**, Cécile Viboud, Siddharth Chandra, and Shweta Bansal. Spatio-Temporal Patterns and Diffusion of the 1918 Influenza Pandemic in British India. *American Journal of Epidemiology*.
- 2018 Manlove, Kezia, Christina Aiello, **Pratha Sah**, Bree Cummins, Peter J. Husdon, and Paul C. Cross. The ecology of movement and behaviour: a saturated tripartite network for describing animal contacts. *Proceedings of the Royal Society B*, 285(1887), 20180670.
- 2018 **Sah Pratha**, Janet Mann and Shweta Bansal. Disease implications of animal social network structure: a synthesis across social systems. *Journal of Animal Ecology*, 87(3), 546-558.

- 2017 **Sah, Pratha**, Meagan C. Fitzpatrick, Abhishek Pandey, and Alison P. Galvani. HIV criminalization exacerbates subpar diagnosis and treatment across the United States: response to the 'Association of HIV diagnosis rates and laws criminalizing HIV exposure in the United States'. *AIDS*, 31(17), 2437-2439.
- 2017 **Sah, Pratha**, Stephan T. Leu, Paul C. Cross, Peter J. Hudson and Shweta Bansal. Unraveling the disease consequences and mechanisms of modular structure in animal social networks. *Proceedings of the National Academy of Sciences*, 114(16), 4165-4170.
- 2016 **Sah, Pratha**, Kenneth E. Nussear, Todd C. Esque, Christina Aiello, Peter J. Hudson and Shweta Bansal. Inferring social structure and its drivers form refuge use in the desert tortoise, a relatively solitary species. *Behavioral Ecology and Sociobiology*, 70(8), 1277-1289.
- 2016 Aiello, Christina M., Kenneth E. Nussear, Todd C. Esque, Patrick G. Emblidge, **Pratha Sah**, Shweta Bansal, and Peter J. Hudson. Host contact and shedding patterns clarify variation in pathogen exposure and transmission in threatened tortoise *Gopherus agassizii*: implications for disease modelling and management. *Journal of Animal Ecology*, 85(3), 829-842.
- 2014 **Sah, Pratha**, Lisa Singh, Aaron Clauset and Shweta Bansal, Exploring community structure in biological networks with random graphs. *BMC Bioinformatics*, 15(1), 220.
- 2014 **Sah, Pratha**, and Sutirth Dey. Stabilizing spatially structured populations through Adaptive Limiter Control. *PLoS ONE*, 9(8), e105861.
- 2014 Aiello Christina M., Kenneth E. Nussear, Andrew D. Walde, Todd C. Esque, Patrick G. Emblidge, **Pratha Sah**, Shweta Bansal, and Peter J. Hudson. Disease dynamics during wildlife translocations: Disruptions to the host population suggest consequences for transmission as illustrated by desert tortoise spatial networks. 2014. *Animal Conservation*, 17, 27-39.
- 2013 **Sah, Pratha**, Joseph Paul Salve, and Sutirth Dey. Stabilizing biological populations and metapopulations by Adaptive Limiter Control. 2013. *Journal of Theoretical Biology*, 320 (7), 113-123.

Preprints

- 2017 **Sah, Pratha**, and Shweta Bansal. Identifying the dynamic contact network of infectious disease spread. *bioRxiv*, 169573.

Outreach publications

- 2018 Sarah A. Galvani-Townsend and **Sah, Pratha**. Why get vaccinated when the flu vaccine doesn't work well? [Science Journal for Kids](#)

Education

- 2012-2017 **Ph.D.**, *Quantitative disease ecology: network epidemiology, mathematical modeling, computational biology and data science*, Georgetown University, Washington, DC.
Thesis advisor: Dr. Shweta Bansal
- 2009-2011 **M.Sc.**, *Natural resources management*, The Energy and Resources Institute (TERI) University, New Delhi, India.
- 2006-2009 **B.Sc.**, *Zoology, Biotechnology (minor)*, Pune University, Pune, India.

Developed code

- INoDS** Inferring networks of infectious disease spread (Python)
- ModNet** Random modular network generator (Python)
- ASNR** Animal social network repository (HTML)
- Epidemic simulator** Simulate infectious disease spread in static or dynamic contact networks (Python)

Conference session organizer

- 2018 **Integration of Empirical Data in Network Epidemiology**, *NetSci 2018*, Paris, France.

Reviewer

Twelve unique journals, *Nature Communications, Proceedings of the Royal Society B: Biological Sciences, Scientific Reports, Journal of Animal Ecology, Plos One, Ecology and Evolution, Peer J, Journal of Theoretical Biology, Fish and Fisheries, International Journal of Bioinformatics Research and Applications (IJBRA), Diseases of Aquatic Organisms, Transboundary and Emerging Diseases.*

Program Committee Member, *NetSci 2019*, Burlington, Vermont, USA.

Outstanding student paper award, Disease ecology section, *ESA 2018, 2019*, USA.

Mentoring

Middle school, Sarah A. Galvani Townsend (Yale).

Undergraduate, José David Mendez (Georgetown), Madeline Campbell (Georgetown), Henry Banh (Georgetown), Tiffany Yang (Georgetown), Victoria Chen (Yale).

Graduate, Ryan Yucha (Yale).

Teaching

- 2017 **Guest discussion**, *Stage structured models*, Course: Modeling Biological Populations, Georgetown University.
- 2016 **Invited guest lecturer**, *Modeling infectious disease spread in host populations*, Environmental Science II Master Course, George Washington University.

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- 2014 **Teaching Fellow**, Course: *Modeling Biological Populations*, Biology Department, Georgetown University.
- 2013 **Lab Instructor**, Course: *Ecology*, Biology Department, Georgetown University.

Invited talks

- 2019 ***Importance of social behaviour and application of social networks across wildlife biology and conservation***, *Wildlife Research and Conservation*, Berlin, Germany.

Professional presentations

- 2017 ***Disease implications of sociality and network structure***, *Disease ecology section*, ESA 102th Annual Meeting , Portland, Oregon.
- 2017 ***Identifying Dynamic Contact Networks of Infectious Disease Spread***, *NetSci 2017*, Indianapolis, Indiana.
- 2017 ***Disease implications of animal social organization and network structure***, *Graduate research symposium*, Georgetown University.
- 2016 ***Identifying networks of infectious disease spread in wildlife populations***, *Work in progress seminar*, Biology department, Georgetown University.
- 2016 ***Inferring transmission mode and contact network in a wildlife population***, *Disease ecology section*, ESA 101th Annual Meeting , Ft Lauderdale, Florida.
- 2015 ***Modeling perturbations in dynamic contact networks: Ways forward***, *Ignite session: Heterogeneity in Animal Disease Ecology: Then and Now*, ESA 100th Annual Meeting , Baltimore, Maryland.
- 2015 ***Using (modular) random graphs to explore the effect of modular contact networks on wildlife disease spread***, *Disease ecology section*, ESA 100th Annual Meeting, Baltimore, Maryland.
- 2015 ***Burrow use patterns and disease spread in desert tortoise populations***, *Work in Progress Seminar*, Georgetown University, Washington, DC.
- 2014 ***Exploring community structure in ecological networks with random graphs***, *NetSci 2014 Satellite*, Complex Networks in Ecology, Berkeley, California.

Honors and awards

- 2019 Nominated for the 2019 Council of Graduate Schools (CGS)/ProQuest Distinguished Dissertation Award, Biological Sciences category.
- 2018 Young Initiative Award for Satellite Meetings, NetSci 2018
- 2017 Volterra Award for Best Talk, ESA 2018
- 2017 Best student paper award in disease ecology, Ecological Society of America
- 2017 Nomination, Dr. Karen Gale Exceptional PhD Student Award, Georgetown University
- 2017 Outstanding Graduate Student Award, Biology Department, Georgetown University
- 2016 Semi-finalist, Early Career Researcher Prize, Journal of Animal Ecology
- 2016 PLoS Early Career Travel Award

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- 2014 MCED Young Modeler Award for Innovative Contributions to Ecological Modeling
- 2014 Best talk, Work in progress seminar, Biology Department, Georgetown University
- 2014 Cosmos Scholars Grant Program, Cosmos Club Foundation
- 2014 University of Washington SISMID scholarship for attending the Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID 2014); University of Washington, Seattle, July 14 -18, 2014
- 2011 University topper and Gold medalist, MSc, TERI University
- 2010 Summer Research Fellowship, awarded by JNCASR, India
- 2009 State merit (7th rank) and scholarship, Graduate Excellence Examination, Pune, India

Professional development

- 2014 Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID); University of Washington, Seattle
- 2014 NIMBioS Investigative Workshop: Interface Disease Models; Knoxville, Tennessee
- 2013 Python training workshop for Scientists and Engineers; Washington, DC
- 2013 Workshop on data-analysis with R; University of Maryland, Maryland
- 2011 International Conference on Mathematical Biology; Bangalore, India

Leadership positions

- 2015-2016 **Co-president**, *Biology Organization of Graduate Students*, Georgetown University.
- 2014-2015 **Treasurer**, *Biology Organization of Graduate Students*, Georgetown University.
- 2013-2014 **Vice President**, *Graduate International Student Organization*, Georgetown University.
- 2013 **Graduate International Student Ambassador**, *Georgetown University*.
- 2012-2014 **Graduate Student Representative**, *Graduate Student Organization*, Georgetown University.

Membership

- 2017-18 Ecological Society of America