

Pratha Sah

Curriculum Vitae

Research interests

Infectious disease epidemiology, network analysis, computational and statistical modeling, and quantitative disease ecology

Education

- 2012– **Ph.D.**, *Biology: Infectious disease modeling, network epidemiology*, 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, vocational biotechnology*, Pune University, Pune, India.

Publications

- 2017 **Sah, Pratha**, Leu S.T., Cross P.C., Hudson P. J. and Bansal, S. Unraveling the disease consequences and mechanisms of modular structure in animal social networks. 2017. *PNAS*, Accepted.
- 2017 **Sah Pratha**, Mendez J.M. and Bansal, S. Disease implications of animal social network structure and sociality - a quantitative analysis. Invited review. *Journal of Animal Ecology*. Under preparation.
- 2016 **Sah, Pratha**, Nussear K. E., Esque T. C., Aiello C., Hudson P. J. and Bansal, S. Inferring social structure and its drivers from refuge use in the desert tortoise, a relatively solitary species. 2016. *Behavioral Ecology and Sociobiology*, 70(8), 1277-1289.
- 2016 Aiello, C. M., Nussear, K. E., Esque, T. C., Emblidge, P. G., **Sah, P.**, Bansal, S., and Hudson, P. J. Host contact and shedding patterns clarify variation in pathogen exposure and transmission in threatened tortoise *Gopherus agassizii*: implications for disease modelling and management. 2016. *Journal of Animal Ecology*, 85(3), 829-842.
- 2014 **Sah, Pratha**, Singh L., Clauset A. and Bansal, S. Exploring community structure in biological networks with random graphs. 2014. *BMC Bioinformatics* 15(1), 220.
- 2014 **Sah, Pratha**, and Dey, S. Stabilizing spatially structured populations through Adaptive Limiter Control. 2014. *PLoS ONE*, 9(8), e105861.

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- 2014 Aiello C. M., Nussener K. E., Walde A. D., Esque T. C., Emblidge P. G., **Sah P.**, Shweta B., and Hudson P. J. 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(S1), 27-39.
- 2013 **Sah, Pratha**, Salve, Joseph and Dey, S. Stabilizing biological populations and metapopulations by Adaptive Limiter Control. 2013. *Journal of Theoretical Biology*, 320 (7), 113-123.

Software

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

Professional service

Ad hoc reviewer for journals, *Journal of Theoretical Biology (JTB)*, *PLoS ONE*, *International Journal of Bioinformatics Research and Applications (IJBRA)*.

Teaching experience

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

Relevant courses

- Ph.D. *Principles of epidemiology, Deterministic math models, Population genetics, Stochastic simulation*
- M.Sc. *Applied mathematics, Statistical techniques, Ecology, Environment and climate: law and policy, Introduction to sustainable development, Biodiversity assessment and conservation, Principles of geoinformatics, Environmental and resource economics, Ecosystem dynamics and climate change, Advanced statistics, Research methodology*

Professional oral presentations

- 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.

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- 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.

Seminars, symposia and workshops attended

- 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

Honors and awards

- 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
- 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

Work experience

- 2013-2014 **Teaching Fellow**, *Department of Biology, Georgetown University, Washington, DC.*
- 2012-2013 **Graduate research assistant**, *Department of Biology, Georgetown University, Washington, DC.*

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- 2011-2012 **Project fellow**, *Biology Department, IISER, Pune, India.*
- 2010 **Research intern**, *Greenobin, New Delhi, India.*
- 2010 **Science Writer**, *Prakritilive, New Delhi, India.*

Leadership positions held

- 2015- **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.*

Technical skills

Scripting, programming languages: Python (3+ years), R (3+ years), MATLAB (familiar)

Statistical software environment: R (3+ years), Minitab (familiar)

OS: Linux, Windows

Cloud computing: Amazon Web Services (AWS)

Network analysis and visualization: Gephi, igraph, Networkx, graph-tool

RDBMS: MySQL

Markup language: \LaTeX , HTML

Version control: Git, [GitHub](#)