Dr. JING JIAO

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Department of Biology,
Texas Christian University,
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EDUCATION

Ph.D. University of Florida, Gainesville, FL 2011-2017
Major: Zoology
Minor: Statistics

M.S. East China Normal University, Shanghai, China 2008-2011
Major: Ecology

B.S. East China Normal University, Shanghai, China 2004-2008
Major: Statistics

ACADEMIC POSITIONS

1. Assistant Professor, Department of Biology, Texas Christian University, 8/2023~
2. Research Associate, Department of Biological Science, Florida State University, 10/2020-8/2023
3. NIMBioS Postdoctoral Research Associate, University of Tennessee, Knoxville, 9/2018-10/2020
4. Research Associate, Quantitative Fisheries Center, Michigan State University, 9/2017-9/2018

TEACHING INTERESTS

Evolution, Ecology, Conservation Biology, Biostatistics, Disease Ecology
Quantitative Methods, Research Methods, Mathematical Biology, Public Health Modeling

COURSE TAUGHT

1. Evolution, Disease, and Medicine – TCU, UT Knoxville
2. Biostatistics (graduate) – TCU
3. General Biology Lab – University of Florida (TA for 300+ students)
4. Biology Seminar – TCU

RESEARCH INTERESTS AND SKILLS

- Statistical analyses, mathematical modeling and machine learning
- Computational ecology, epidemiological modeling, and within-host pathogen dynamics
- Expertise in R (preferred language), MATLAB, and quantitative/statistical modeling
- Cross-functional collaboration with psychology, empirical biologists and data science teams
- Experience designing study protocols, conducting analyses, and publishing results

EXPERIENCE APPLYING FOR FUNDING

1. **1. Participating in NSF APPEX Project (2025–present):** Contributed to a systematic review on the topic of team science with researchers from multiple universities and drafted one manuscript.

2. **Integrating sociopsychology into control behaviors of vector-borne diseases**, PI: Jing Jiao; co-PIs: Cathy Cox (TCU), Nina H. Fefferman (UTK), Yuede Ji (UT Arlington), Dana Pasquale (Duke), Collaborative proposal in final preparation for submission to **NSF IHBEM**
3. **Exploring how tobacco use influences infectious disease control**, PI: Jing Jiao; Co-PI: Qinghua Yang (TCU). Engaged in cross-disciplinary collaboration in preparation for submission to **NIH R15**
4. **Collaborative Research: Advancing theory for disease dynamics in marine systems**, PI: Jing Jiao, Co-PIs: Michael H. Cortez (FSU) and Nina H. Fefferman (UTK), Submitted to **NSF Division of Mathematical Biology** (October 2024)
   Received strong reviews (1 "Excellent," 4 "Very Good," 1 "Good"), currently under revision for resubmission.
5. **Preliminary modeling about marine disease transmission**, PI: Jing Jiao. Funded by TCU Junior Faculty Summer Research Program (JFSRP) 4/2024-7/2025
6. **RAPID: Estimating the Impact of Behavioral and Etiological Confounders in Real-time Surveillance for Outbreaks of Novel Pathogens**: grant preparation (funded) 3/5/2020-10/2020

PUBLICATIONS (mentored students are underlined)

1. **Jiao J**. The Waxing and Waning of Fear Influence the Control of Vector-Borne Diseases. *Mathematics*, 2025, 13(5): 879.
2. **Jiao J**, Cortez M H. How priority effects within co-infected individuals scale up to affect disease risk in a two-host-two-pathogen system. *Ecological Modelling*, 2025, 502: 111025.
3. Grandison, B, Yin, H, Kilgore, A, Young, M, **Jiao, J**, N Fefferman (2023). Epidemiology, Game Theory, and Evolutionary Rescue: Understanding How Outbreaks Impact Population Viability. *Letters in Biomathematics*, 10(1), 75-86.
4. **Jiao, J**, MH Cortez (2022). Exploring How a Generalist Pathogen and Within-Host Priority Effects Alter the Risk of Being Infected by a Specialist Pathogen. *The American Naturalist*, 200(6), 815-833.
5. Nguyen, D, Wakhare, T, **Jiao, J**, Myers, K, Udiani, O, N Fefferman (2022). Seasonality in multi-host disease systems. *Ecological Modelling*, *470*, 109973.
6. **Jiao, J**, G Suarez, N Fefferman (2021). How public reaction to disease information across scales and the impacts of vector control methods influence disease prevalence and control efficacy. *PLOS Computational Biology*, 17(6): e1008762.
7. **Jiao, J**, N Fefferman (2021) The dynamics of evolutionary rescue from a novel pathogen threat in a host metapopulation, *Scientific Reports*, 11(1): 1-13.
8. Tong, X, SG Compton, **J Jiao**, Y Chen Y, YY Ding, R Wang, XY Chen (2021). Dual effects of insect fecundity overdispersion on the Wolbachia establishment and the implications for epidemic biocontrol. *Journal of Pest Science*: 1-11.
9. **Jiao, J**, L. Riotte-Lambert, SS. Pilyugin, MA. Gil and CW. Osenberg (2020) Mobility and its sensitivity to fitness differences determine consumer-resource distributions. *Royal Society Open Science*: 200247.
10. **Jiao, J**, M. Gilchrist, N. Fefferman (2020). The Impact of Host Metapopulation structure on short-term evolutionary rescue in the face of a novel pathogenic threat. *Global Ecology and Conservation*: e01174.
11. Marino Jr, JA, SD Peacor, DB Bunnell, HA Vanderploeg, SA Pothoven, AK Elgin, JR Bence, **J Jiao**, EL Ionides (2019). Evaluating consumptive and nonconsumptive predator effects on prey density using field time-series data. *Ecology*, *100*(3): e02583.

12. **Jiao, J**, SS Pilyugin, L Riotte-Lambert, CW Osenberg (2018). Habitat-dependent movement rate can determine the efficacy of marine protected areas. *Ecology*, *99*(11): 2485-2495.
13. **Jiao, J**, SS Pilyugin, CW Osenberg (2016). Random movement of predators can eliminate trophic cascades in marine protected areas. *Ecosphere*, *7*(8): e01421.
14. Gil, MA, **J Jiao**, CW Osenberg (2015). Enrichment scale determines herbivore control of primary producers. *Oecologia* 180:833-840.
15. Wang, XY, DW Shen, **J Jiao**, NN Xu, S Yu, XF Zhou, MM Shi, XY Chen (2012). Genotypic diversity enhances invasive ability of Spartina alterniflora. *Molecular Ecology* 21:2542-2551.
16. Chen, XY, **J Jiao**, X Tong (2011). A generalized model of island biogeography. *Science China: Life Science*, 54: 1055-1061.
17. Li, JH, **J Jiao**, K Jiang and YY Li (2011). Development and characterization of microsatellites in Torreya JackII (Taxaceae), an endangered species in China. *American Journal of Botany*, 98:e349-e351.
18. **Jiao, J**, JJ Guan, YH Xie (2010). Conference Review: The 2nd Chinese R Conference. *The R Journal*, 2: 60-61.
19. Yang, SZ, Y Ma, P Jiang, **J Jiao**, YF Zhu, MS Zhao, XY Chen (2009). Soil physical and chemical properties along altitudes of Western Tianmushan. *Journal of East China Normal University*, 6:101-107.

MANUSCRIPTS SUBMITTED OR IN PREPARATION

20. **Jiao, J**, J. Ferguson, A. Hasik, A. Siepielski. Nonlinear pathogen interactions alter the scaling of coinfection patterns in a damselfly system. (Final draft complete; targeted for submission to *Methods in Ecology and Evolution*).
21. Wu, B., **J. Jiao**. Exploring evolutionary rescue of white-nose syndrome in bats under seasonal migration (in prep.)
22. Liam, R., Xiong, G, **J. Jiao**. The vector-borne disease dynamics in communities with different disease control policies (in prep.)
23. **Jiao, J**, N Fefferman. Exploring how mismatch of disease and harvesting seasonality affects crop disease dynamics (in prep.). *Proceedings of the Royal Society B: Biological Sciences.*

TEACHING AND MENTORING EXPERIENCES

1. **Sole Instructor of Record**, Texas Christian University: I design and teach two graduate-level courses: *Evolution, Disease and Medicine, Biostatistics.* 8/2023~
2. **Class designer**, University of Tennessee, TN: I participated in the design and test of a teaching activity about honeycreeper conservation for young children and pre-K students: *Biology in A Box* 10/2020~10/2022.
3. **Sole Instructor of Record**, University of Tennessee, Knoxville, TN: I designed and lectured one 3-credit undergraduate class: *Evolution, Disease and Medicine.* 2/2019-7/2019
4. **Co-Mentor**, NIMBioS Summer Research Experiences (SRE) program: I co-guided three undergraduate students in developing project hypothesis and provided methodological support. One related manuscript is under active preparation. 6/4/-7/26/2019
5. **Teaching Assistant**, University of Florida, Gainesville, FL: I designed, organized and lectured one general biology lab (> 300 undergraduate students across multiple disciplines). 8/2012-12/2016

OUTREACH ACTIVITIES

1. **Consulting facilitator**, The Mathematical Modeling Consulting Center: I worked as a facilitator for a NIMBioS seminar series entitled "A Tasting Menu of Mathematical Models". 10/2018
2. **Statistic Consultant**, The Mathematical Modeling Consulting Center: I provide help with, and advice on, statistical analyses to students and faculty at the University of Tennessee 2/2020~

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AWARDS AND GRANTED SCHOLARSHIP

1. Charles Vincent and Heidi Cole McLaughlin Endowment Dissertation Fellowships, Department of Biology, University of Florida 1/15/2017-5/25/2017
2. QSE3 IGERT[1] interdisciplinary research funding, Department of Mathematics, University of Florida 10/1/2015-5/31/2016
3. QSE3 IGERT[1] interdisciplinary research funding, Department of Biology, University of Florida 8/1/2011-5/31/2012
4. Outstanding Achievement Certificate, University of Florida International Center (UFIC), University of Florida 12/10/2012

PRESENTATIONS

Invited talks:

1. **Jiao, J.** *Mathematical Modeling in Disease Epidemiology*. Mathematical department, Texas Christian University 4/2025
2. **Jiao, J**. *The waxing and waning of fear influence the control of vector-borne diseases*. University of Oklahoma: https://www.ceom.ou.edu/outreach/workshops/content/10 10/2024
3. **Jiao, J**. *How psychology influences human control on vector-borne diseases?* Biopsy seminar, psychology department, Texas Christian University 9/2024
4. **Jiao, J**. *Public's fear to death can determine host-vector interactions*. Morsel Talk at NIMBioS University of Tennessee, Knoxville 6/2024
5. **Jiao, J.**, M. Gilchrist and N. Fefferman. *The impact of host metapopulation structure on short-term evolutionary rescue in the face of a novel pathogenic threat*. AMS Southeastern Sectional Meeting, Charlottesville, VA (canceled due to COVID-19)
6. **Jiao, J.** and N. Fefferman. *A transient disease cycles in host-pathogen interactions when host migrate among patches.* Biology Seminar in Florida State University, Tallahassee, FL (canceled due to COVID-19)
7. **Jiao, J.** and N. Fefferman. *A disease cycle pattern in a spatial-structured host population*. Dr. Joshua Weitz's lab Seminar in Georgia Tech, Atlanta, Georgia 2/2020

[1] **QSE3 IGERT** (DGE-0801544) is Quantitative Spatial Ecology, Evolution, and Environment Integrative Graduate Education Research Traineeship NSF (QSE3 IGERT/NSF).

8. **Jiao, J.** and N. Fefferman. *Host metapopulation, disease epidemiology and host evolution*. Georgia Tech Biomath Seminar, Atlanta, Georgia 10/2018

Contributed Presentations:

9. **Jiao, J**. *Fear-to-Death influences the control of vector-borne diseases*. **Annual meeting of Ecology Society of America**, long beach, CA. 8/2024
10. **Jiao, J.**, MH. Cortez. *How within-host priority effects between specialist and generalist pathogens affect disease risk.* **Symposium on Biomathematics and Ecology Education and Research**, virtual meeting 11/2021
11. **Jiao, J.**, MH. Cortez. *Exploring how generalist pathogens and priority effects alter the risk of being infected by specialist pathogens.* **Annual Meeting of Ecology Society of America**, virtual meeting 8/2021
12. **Jiao, J.**, M. Gilchrist, N. Fefferman. *The Impact of Host Metapopulation structure on short-term evolutionary rescue in the face of a novel pathogenic threat.* **Annual Meeting of Ecology Society of America, virtual meeting**, virtual meeting 8/2020
13. **Jiao, J.**, M. Gilchrist, N. Fefferman. *The influences of host evolution on host-pathogen interactions across space.* **Annual Meeting and Conference of the Society for Mathematical Biology**, Montreal, CA 7/2019
14. **Jiao, J**., SD. Peacor, JA Marino, Jr., J. Bence, DB. Bunnell, HA. Vanderploeg, SA. Pothoven, AK. Elgin and EL. Ionides. *Temperature influences the consumptive and non-consumptive effects of predators on zooplankton production in the Great Lakes*. **Annual Meeting of the Ecological Society of America**, New Orleans, Louisiana 8/2018
15. **Jiao, J.**, L. Riotte-Lambert, SS. Pilyugin, MA. Gil and CW. Osenberg. *Mobility determines consumer resource interactions across space and time*. **Annual Meeting of the Ecological Society of America**, Fort Lauderdale, Florida 8/2016
16. **Jiao, J.**, L. Riotte-Lambert, SS. Pilyugin, MA. Gil and CW. Osenberg. *Mobility determines consumer resource interactions across space and time.* **Gordon Research Conference "Unifying Ecology Across Scales"**, Biddeford, Maine 7/2016
17. **Jiao, J.**, SS. Pilyugin, and CW. Osenberg. *Movement reverses trophic cascades in marine reserves.* **North Florida Marine Science Symposium**, St. Augustine, Jacksonville, Florida 1/2014
18. **Jiao, J.**, SS. Pilyugin, and CW. Osenberg. *Movement reverses trophic cascades in marine reserves.* **Gordon Research Conference "Predator-Prey Interactions",** Ventura, California 1/2014
19. **Jiao, J.**, J. Langebrake, L. Riotte-Lambert and CW. Osenberg *Differential movement of harvested organisms affects predicted responses to Marine Protected Areas.* **42th benthic conference**, Savanna, Georgia. 3/2013