Brendan Case

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Infectious disease modeling • Bayesian statistics • Experimental design

Summary

PhD student in Computer Science combining mechanistic modeling and Bayesian statistics for the study of epidemiology and ecology. I am particularly interested in using these tools for informing how data should be collected and for assessing control options from a decision-theoretic perspective.

Education

2018– **Ph.D. Computer Science**, *University of Vermont*, Burlington, Vermont.
  ○ Co-advisors: Laurent Hébert-Dufresne and Jean-Gabriel Young

2017–2019 **MRes. Natural Computation**, *University of Birmingham*, Birmingham, UK.
  ○ Thesis: Self-adaptation in non-elitist evolutionary algorithms: a rigorous analysis on discrete problems with unknown structure
  ○ Committee: Per Kristian Lehre (advisor), Thomas Jansen, Ata Kaban

2013–2017 **B.A. Mathematics**, *Oberlin College*, Oberlin, Ohio.
  ○ Minor: Computer Science

Publications

Spatial epidemiology and adaptive targeted sampling to manage the Chagas disease vector Triatoma dimidiata
B. K. M. Case, Jean-Gabriel Young, Daniel Penados, Carlota Monroy, Laurent Hébert-Dufresne, Lori Stevens
PLOS Neglected Tropical Diseases. 2022. doi:10.1371/journal.pntd.0010436

Flowers as dirty doorknobs: Deformed wing virus transmitted between Apis mellifera and Bombus impatiens through shared flowers
Phillip Alexander Burnham, Samantha Alger, **Brendan Case**, Humberto Boncristiani, Laurent Hébert-Dufresne, Alison Brody
Journal of Applied Ecology. 2021. doi:10.1111/1365-2664.13962

The unintended consequences of inconsistent pandemic control policies
Benjamin Althouse, Brendan Wallace, **Brendan Case**, Samuel Scarpino, Antoine Allard, Andrew Berdahl, Easton White, Laurent Hébert-Dufresne
MedRxiv. 2020. doi:10.1101/2020.08.21.20179473

Self-adaptation in nonelitist evolutionary algorithms on discrete problems with unknown structure
Brendan Case and Per Kristian Lehre
IEEE Transactions on Evolutionary Computation. 2020. doi:10.1109/TEVC.2020.2985450

Presentations

Conference talks

Jun 2019 **Hidden geometry of infestation in Chagas disease vectors: an approach from epidemiological network theory**, *Laboratorio de Entomología Aplicada y Parasitología Research Symposium*, Guatemala City, Guatemala.

May 2019 **Modeling disease spillover using multipartite networks**, *NetSci 2019*, Burlington, VT.

Apr 2019 **Modeling disease spillover in bees: exploring dilution effects**, *UVM Student Research Conference*, Burlington, VT.

Posters

Mar 2022 **Parameter inference in epidemiological modeling: a perspective from Bayesian experimental design**[1], *NERCCS 2022: Fifth Northeast Regional Conference on Complex Systems*, Buffalo, NY.

Sep 2019 **QuEST timeline: highlights from the first year**, *NSF National Research Traineeship annual meeting*, Evanston, IL.

Teaching

Teaching Assistant

Spring 2020 **Computability and Complexity**, *University of Vermont*.

Fall 2019 **Modeling Complex Systems**, *University of Vermont*.

Spring 2018 **Software Workshop I**, *University of Birmingham*.

Fall 2017 **Data Structures and Algorithms**, *University of Birmingham*.

Spring 2017 **Foundations of Analysis**, *Oberlin College*.

Spring 2017 **Algorithms**, *Oberlin College*.

Fall 2016 **Discrete Mathematics**, *Oberlin College*.

Workshops & Invited Lectures

9/14 2022 **Introduction to epidemiological models and disease forecasting**, *EPID 394: Infectious Disease Epidemiology*, University of South Carolina (virtual).

8/2 2022 **Spatial epidemiology and adaptive targeted sampling to manage domestic Triatomine infestations in Guatemala**, *UPENN-Tulane-UPCH Zoonotic Disease Research Lab*, University of Pennsylvania (virtual).

10/25 2021 **Bayesian Geostatistics and Adaptive Sampling**, *TGIR Adventures in Modeling*, University of Vermont.

8/16–8/23 2021 **QuEST Coding Workshop for Incoming Trainees**[2], University of Vermont.

11/15 2019 **The Rest of the Tidyverse**, *BIOL 381: Foundations of Quantitative Reasoning*, University of Vermont.

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[1]best poster award
[2]Lecture notes

Professional Service and Leadership

Apr 2022	*Reviewer*, Swarm and Evolutionary Computation.
Apr 2022	*Judge*, Vermont Science Olympiad. Event: Experimental Design.
Feb 2022	*Reviewer*, Physical Review E.
Aug 2021	*Reviewer*, Swarm and Evolutionary Computation.

Advanced Schools & Workshops

12/15–12/20 2019	**Complex Networks Winter Workshop**, *Université Laval*, Quebec City, Canada.
6/3–6/5 2019	**VectorBase Workshop**, *Universidad del Valle de Guatemala*, Guatemala City, Guatemala.

Scholarships

2022	**T35 Research Traineeship**, *National Institute for Allergy and Infectious Diseases & University of South Carolina Big Data Health Science Center*, award 5T35AI165252-02.
2018-2023	**QuEST National Research Traineeship**, *National Science Foundation & University of Vermont Graduate College*, award DGE-1735316.
2013-2014	**Conservatory Dean's Scholarship**, *Oberlin College*.

Skills & Expertise

Programming languages	R (tidyverse, tidygraph, sf/raster, caret), Julia (DifferentialEquations), Python (graph-tool)
Statistical programming	Stan, R-INLA, nimble, Turing.jl
Visualization	ggplot2, ggraph, Inkscape

Community Service

2020-2022	Food Not Bombs, volunteer cook, *Burlington, VT*.
2018-2019	GoodGym, general member, *Birmingham, UK*.
2014-2015	Boys and Girls Club, tutor, *Oberlin, OH*.

Professional References

Lori Stevens	Professor, University of Vermont	*Lori.Stevens@uvm.edu* *(802) 656-0445*
Per Kristian Lehre	Senior Lecturer, University of Birmingham	*p.k.lehre@cs.bham.ac.uk* *+44 (0)121 414 8560*
Melissa Pespini	Associate Professor, University of Vermont	*Melissa.Pespeni@uvm.edu* *(802) 656-0628*