MARIAH C. BOUDREAU

CONTACT

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EDUCATION

University of Vermont
August 2019 - May 2024 (est.)
Ph.D. in Mathematical Sciences
Advisors: Chris Danforth & Laurent Hébert-Dufresne

Saint Michael's College
August 2015 - May 2019
B.S. in Mathematics
Minors in Computer Science & Statistics

SKILLS

Python, R, MATLAB, LaTeX, Java, C++

Statistical analysis

Communication, collaboration, problem solving, critical thinking, positive attitude

Conversational French

RESEARCH INTERESTS

Stochastic models of disease dynamics that inform scientists and decision makers

RELEVANT COURSEWORK

Differential Equations (DE) | Advanced Ordinary DE | Partial DE, Linear Algebra | Numerical Analysis | Numerical Partial DE | Principles of Complex Systems | Modeling of Complex Systems I & II | Probability and Statistics | Bayesian Statistics | Philosophy of Science, Technology, and Enrvironment | Philosophy of the Mind, Free Will and Neuroethics

PERSONAL INTERESTS

Hiking, skiing, alpine touring, Crossfit and sudoku puzzles

PROFESSIONAL EXPERIENCE

Ph.D. Candidate
University of Vermont   August 2019 - Present
- Graduate Research Assistant
- Graduate Teaching Assistant

Contractor
Institute for Disease Modeling at the   May 2022 - July 2022
Bill and Melinda Gates Foundation

RESEARCH

Stochastic Modeling

- Integrated interventions into a time-dependent probability generating function model for an epidemiology application
- Defined metrics for comparing targeted and random vaccination strategies with the result of that model
- Supported development of an open-source Human papillomavirus (HPV) population model
- Developed a mechanistic model using master equations to give HPV viral load parameter estimates for population model listed above
- Conducted a sensitivity analysis for a probability generating function model through simulations for an epidemiology application

Data Science

- Processed blood work data for the Lived Experience Measured Using Rings study at the University of Vermont
- Analyzed the relationship between blood work data and Oura ring sleep data

Other

- Analyzed ski resort trail networks using network measures
- Workshopped preliminary analysis for lemur food networks

PUBLICATIONS AND OTHER WRITINGS

September 2023
M.C. Boudreau, A.J. Allen, N.J. Roberts, A. Allard & L. Hébert-Dufresne
Temporal and probabilistic comparisons of epidemic interventions
Bulletin of Mathematical Biology (in press)

February 2023
R.M. Stuart, J.A. Cohen, C.C. Kerr, R.G. Abeysuriya, M. Zimmerman, D.W. Rao, **M.C. Boudreau**, & D.J. Klein
HPVsim: An agent-based model of HPV transmission and cervical disease
MedrXiv

February 2022
A.J. Allen, **M.C. Boudreau**, N.J. Roberts, A. Allard & L. Hébert-Dufresne
Predicting the diversity of early epidemic spread on networks
Phys. Rev. Research

In Progress
M.C. Boudreau, J.A. Cohen & L. Hébert-Dufresne
Working title: *Epithelium dynamics model with master equations: a case study with Human Papillomavirus*
Draft available upon request

In Progress
M.C. Boudreau, C.M. Danforth & L. Hébert-Dufresne
Working title: *Sensitivity analysis of stochastic polynomials, and its application to epidemic forecasting and random graphs*
Draft available upon request