

Juliana C. Taube

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Education

Bowdoin College

Brunswick, ME

A.B. *summa cum laude* WITH HONORS IN MATHEMATICS, MINOR IN BIOLOGY, GPA: 4.0/4.0

2017 - 2021

Undergraduate thesis: Modeling coupled disease-behavior dynamics of SARS-CoV-2 using influence networks

Advisors: Professors Mary Lou Zeeman (Mathematics) and Mohammad Irfan (Computer Science & Digital and Computational Studies)

Relevant coursework: Linear Algebra, Probability, Statistics, Bayesian Statistics, ODEs, PDEs, Data Structures, Social & Economic Networks, Evolution, Ecology, Microbiology, Genetics & Molecular Biology, Science Communication

Research Experience

Georgetown University

Washington, D.C.

RESEARCH ASSOCIATE, ADVISOR: SHWETA BANSAL, PHD

Aug. 2021 - present

- Analyzing spatiotemporal trends between three nationwide masking surveys
- Implementing Bayesian partial pooling/mixed effects model to estimate masking at the county-level based on survey responses

Bowdoin College

Remote

STUDENT RESEARCHER, ADVISORS: MARY LOU ZEEMAN, PHD; MOHAMMAD IRFAN, PHD

May 2021 - present

- Continued honors thesis work in preparation for publication, specifically:
 - Adapted model to account for both global and local risk perception
 - Modified underlying network structure to better resemble real-world contact networks
 - Analyzed the role and interaction of risk perception and social influence terms in our model

Centers for Disease Control and Prevention, Division of Global Migration & Quarantine, Office of Innovation, Development, Evaluation, and Analytics

Remote

INTERN, ADVISORS: ARDATH GRILLS, PHD; SARAH BOWDEN, PHD; MICHAEL JOHANSSON, PHD

May - Aug. 2020

- Gathered, cleaned, and wrangled census and meat-packing location data for COVID-19 hotspot model
- Used boosted regression tree machine learning model to predict and characterize COVID-19 county hotspots
- Collected data (attendance, venue size, event duration) for large gatherings considered COVID-19 superspreader events
- Looked for correlations between event aspects and disease transmission, in effort to estimate dispersion parameter
- Contributed to model implementation and assessment of interventions to mitigate COVID-19 spread on cruise ships

University of Georgia, Odum School of Ecology

Athens, GA

STUDENT RESEARCHER (REU), ADVISORS: JOHN M. DRAKE, PHD; PAIGE B. MILLER, PHD

May - July 2019

- Compiled and standardized infectious disease transmission trees from the literature into an R database
- Analyzed predictors of outbreak size & quantified the contribution of superspreading to onward transmission
- Tested theory relating frequency of superspreading events and the dispersion parameter

STUDENT RESEARCHER (REMOTE), ADVISORS: JOHN M. DRAKE, PHD; PAIGE B. MILLER, PHD

June - Dec. 2020

- Expanded database to include COVID-19 transmission trees and released data online at outbreaktrees.ecology.uga.edu 🔗
- Further explored frequency, timing, and generation of superspreaders for COVID-19 relative to other diseases using database
- Findings were submitted for publication in PLoS Biology

Dartmouth Hitchcock Medical Center

Lebanon, NH

INTERN, ADVISOR: PETER F. WRIGHT, MD

June - Aug. 2017

- Assisted with development of Gates Foundation funding proposal: Applying the Lessons Learned from Polio Eradication
- Compiled and summarized literature on smallpox and polio eradication efforts, highlighting similarities and differences
- Organized data on bronchiolitis and RSV hospitalizations in New England

Publications

An open-access database of infectious disease transmission trees to explore superspreader epidemiology

TAUBE JC, MILLER PB, DRAKE JM. *Under revision for resubmission to PLoS Biology*

<https://www.medrxiv.org/content/10.1101/2021.01.11.21249622v1> 🔗

Presentations

Invited talk for Prof. Mohammad Irfan's Research Group at Bowdoin College

MODELING COUPLED DISEASE-BEHAVIOR DYNAMICS OF SARS-CoV-2 USING INFLUENCE NETWORKS

Online

Oct. 2021

Rapid Fire Talk at MIDAS Meeting 2021

AN OPEN-ACCESS DATABASE OF INFECTIOUS DISEASE TRANSMISSION TREES TO EXPLORE SUPERSPREADER
EPIDEMIOLOGY

Online

May 2021

Poster at Epidemics 7

WHO INFECTED WHOM? CREATING A DATABASE OF TRANSMISSION TREES FOR COMPARATIVE OUTBREAK
ANALYSIS

Charleston, SC

Dec. 2019

- Poster additionally presented at University of Georgia's Final Summer REU Poster Session (July 2019) and Bowdoin College's President's Summer Research Symposium (October 2019)

Awards & Honors

- 2021 **Student Faculty Research Grant Fellowship**, summer funding from Prof. Zeeman's NSF grant for continued research (\$1920)
- 2020 **Almon Goodwin Prize**, awarded to exemplary members of Phi Beta Kappa
- 2020 **Phi Beta Kappa**
- 2020 **Sarah and James Bowdoin Scholar & Book Award Winner** (4x), Book Award is for students with 4.0 GPA
- 2020 **Bowdoin Funded Internship Grant**, for internship with CDC (\$5000)
- 2019 **REU Travel Grant for Epidemics 7**, from Rocky Mountain Biological Laboratory (\$2000)
- 2019 **Bowdoin College Goldwater Scholarship Nominee**
- 2018 **First Year Chemistry Award**, recognizes outstanding promise and achievement in chemistry
- 2017 **Bowdoin Faculty Scholar**, recognizes students who achieved excellence in their high school coursework (\$3000)
- 2017 **Bowdoin National Merit Scholarship** (\$1000/yr)

Teaching Experience

Bowdoin College

Brunswick, ME

MATHEMATICS TEACHING ASSISTANT

Feb. - May 2021

- Partial Differential Equations (MATH 3209): created videos to explain homework solutions or review confusing concepts

DIGITAL AND COMPUTATIONAL STUDIES TEACHING ASSISTANT

Jan. - May 2021

- Contagion (DCS 3350): curated resources and assisted students
- Found and summarized data sources for student disease modeling project, including flight, mobility, population, and contact tracing data
- Collected and organized news articles on other aspects of the COVID-19 pandemic, including racism, economic impacts, and misinformation
- Led weekly study group to help students with their coursework using networkx

COMPUTER SCIENCE TEACHING ASSISTANT

Jan. 2019 - Dec. 2020

- Led weekly two-hour study groups to assist students with their assignments, including asking probing questions, finding the bugs in their code, and explaining concepts from class
 - Introduction to Computer Science (CSCI 1101): Jan. 2019 – Dec. 2020
 - Social and Economic Networks (CSCI/DCS 2350): Sept. – Dec. 2020

Service

Bowdoin Curriculum Implementation Committee

Brunswick, ME

ALTERNATE MEMBER

Aug. 2020 - May 2021

- Attended committee meetings to provide student perspective
- Reviewed course proposals and considered how they fit into the Bowdoin curriculum and whether they satisfied distribution requirements
- Suggested revisions to course descriptions for the course catalogue

Bowdoin Student-Athlete Advisory Committee

Brunswick, ME

MEMBER

Aug. 2020 - May 2021

- Representative from Bowdoin's Women's Varsity Ice Hockey Team
- Advocated for team needs and worked with college administration to implement NCAA and NESCAC initiatives

Bowdoin Women's Ice Hockey Community Service Representative

Brunswick, ME

LEADER

Aug. 2019 - May 2020

- Organized team community service activities including participation in school-wide Common Good Day
- Explored volunteering opportunities with local food pantry & hockey leagues, suspended due to COVID-19

Parkview Medical Center

Brunswick, ME

VOLUNTEER

Sept. - Dec. 2018

- Guided patients to the waiting room and procedure area
- Interacted with and comforted patients in the Pain Procedure Suite
- Organized billing materials, stocked medical supplies, and disinfected procedure furniture

Training

Summer Institute in Biostatistics

Minneapolis, MN

UNIVERSITY OF MINNESOTA

June - July 2018

Coursework: 6 weeks of classes in biostatistics, epidemiology, and statistical computing using R and SAS

Final project: Outlined clinical trial protocol of canakinumab in HIV+ patients

Skills

Programming R, Python, Java, Mathematica

Software LaTeX, Git, MacOS, Microsoft Office