ETHAN HOBBS CURRICULUM VITAE

RESEARCH INTERESTS

Complex Systems; Emergent Properties; Living Systems; Biostatistics; Data Science; Public Health

EDUCATION

University of Colorado - Boulder Boulder, CO
MS in Computer Science Expected Dec 2021
Cumulative GPA: 3.71/4.0
Relevant Coursework: Network Analysis and Modeling; Quantitative Optical Imaging; Design Anlysis of Algorithms; Computational Mathematical Biology

Carthage College Kenosha, WI
B.A. in Physics and Mathematics May 2018
Minors in Spanish and Theater
Cumulative GPA: 3.87/4.00
Relevant Coursework - Physics: Mechanics; Optics; Computational Data Analysis; Mathematical Physics
Relevant Coursework - Mathematics: Multivariate Calculus; Linear Algebra; Differential Equations; Abstract Algebra; Combinatorics; Real Analysis; Theory of Statistics

PREVIOUS RESEARCH EXPERIENCE

Fire Ant Aggregation Dynamics
CU-Boulder May 2019–Jan 2021
Research Advisor: Dr. Franck Vernerey, CU-Boulder, Mechanical Engineering
Exploration of the material properties of Fire Ant aggregations through experiments and simulations to further build active soft matter theory.

Reducing Pollinator Decline
CU-Boulder Mar 2019–May 2019
Research Advisor: Dr. Colin Campbell, University of Edinburgh, Chemistry
A review on the causes of pollinator loss to explore radical possibilities for the reduction in the rate of decline. A team science project conducted with students Philip Benson (CU-Boulder Biochemistry) and Sierra Jech (CU-Boulder Evolutionary Biology

Patterns in Barn Swallow Nest Site Settlement
CU-Boulder Jan 2019–Mar 2019
Research Advisor: Dr. Rebecca Safran, CU-Boulder, Evolutionary Biology
A data based study on the spacial patterns of Barn Swallow settlement over several years at a single site location. Investigated factors like line of sight, familiarity of the site, and amount of light on the nest

The Optimal Path through a Crowd
Carthage College Sep 2017–Apr 2018
Research Advisors: Dr. Orit Peleg, University of Colorado-Boulder and Dr. Haley Yaple, Carthage College
Investigating the best (minimal) path through a crowd at varying levels of noise. Implemented both "social" and phsyical forces to model what an individual would experience moving through the path.

Understanding Collective Motion: Jamming and Crowd Dynamics
Harvard University - TRiCAM REU Program Jun 2017–Aug 2017
Research Sponsor: Professor L. Mahadevan, Harvard University
Research Advisors: Dr. Christoph Weber, Dr. Orit Peleg, Alex Heyde, Harvard University
Participated in a team of four undergraduate researchers that investigated collective motion behavior in crowd scenarios. Created simulations and visualizing software for the Vicsek Model, the Repulsive Vicsek Model, and a Crowd Scenario. Under crowd dynamics, investigated optimal paths for crowd infiltration using controlled agents.

PAPERS

Tredmilling and dynamic protrusions in fire ant rafts, with Robert Wagner, Kristen Such, Franck Vernerey. Royal Scociety Interface, 2021.

A network model of transient polymers: exploring the micromechanics of nonlinear viscoelasticity, with Robert Wagner, Franck Vernerey, Soft Matter, 2021.

PRESENTATIONS

"The Role of Collective Behavior in the Glass Transition"
Senior Physic Thesis Symposium, Carthage College, May 2018.

"The Optimal Path Through a Crowd"
Joint Mathematics Meeting, San Diego, Jan 2018. Poster Presentation

"The Optimal Path Through a Crowd"
Pi Mu Epsilon Regional Undergraduate Mathematics Conference, St. Norbert College, Nov 2017.

"Collective Motion: Jamming and Crowd Dynamics"
Harvard Summer Undergraduate Research Symposium, Harvard University, Aug 2017.

"The Ising Model"
Pi Mu Epsilon Regional Undergraduate Mathematics Conference, St. Norbert College, Oct 2016.

ACADEMIC HONORS & AWARDS

National Science Foundation GRFP - Honorable Mention 2020
Honoraray award for the GRFP for research proposals of high quality but were not selected for the extremely competative grant funding

Sigma Pi Sigma Honors Society Apr 2018
Membership awarded for distinction in the physics major and excellence in presentation of scientific ideas

John Hay Presidential Scholarship 2014– 2018
Awarded for academic excellence, provides 75% tuition coverage

Pi Mu Epsilon Honors Society Apr 2017
Membership awarded for distinction in the mathematics major

Marie and John Sladek Scholarship 2016
Awarded for excellence in both the arts and natural sciences

WORK EXPERIENCE

Teaching Assistant CU Boulder
Computer Science Jun 2021 – Present
Teaching assistant under Michael Levet for Undergraduate Algorithms. Design and teach recitations weekly. Grade homework. Hold office hours to help students with questions from the class and homework problem

Teaching Assistant CU Boulder
Applied Mathematics Jan 2021 – May 2021
Teaching assistant under Dr. Sujeet Bhat for Calculus 1. Design and teach recitations weekly. Grade homework. Hold office hours to help students with questions from the class and homework problems

Teaching Assistant CU Boulder
Mechanical Engineering Sep 2020 – Dec 2020
Teaching assistant under Franck Vernerey for Soft Matter Mechanics. Design and grade homework. Hold office hours to help students with questions from the class and homework problems

Instructor CU Boulder
CU Science Discovery Jun 2020 – Jul 2020
Taught students as part of an instructor team about biotechnology and mathematical biology. Designed and taught a curriculum about modeling disease spread.

TECHNICAL SKILLS

Python - Extensive experience in data visualization and simulation techniques as well as library maintenance
MATLAB - Extensive experience in simulation techniques for research projects
C++ - Experience with large modifying simulations
LaTeX - Experience creating documents for both research articles and classroom reports
Git - Experience managing large simulations and website development

Non-Technical Skills

Languages:
English (Fluent)
Spanish (Proficient)

Music:

Pit Orchestra - *Into the Woods* (Bassoonist)	Feb 2018–May 2018
Pit Orchestra - *The Mystery of Edwin Drood* (Bassoonist)	Feb 2017–May 2017
Carthage Wind Orchestra (1st Chair Bassoonist)	Sep 2014–Jun 2018
Carthage Philharmonic Orchestra (1st Chair Bassoonist)	Sep 2014–Jun 2018
AMATI Small Ensemble (1st Chair Bassoonist)	Aug 2015–Jun 2018