Owen Martin

Ph.D Student

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About me ──────

I study collective behavior and swarm dynamics of social insects in the Peleg lab at CU Boulder. I am an interdisciplinary computer science Ph.D student with a diverse set of skills and interests and a professional background in software engineering. Currently, I am developing mathematical models for synchronized $P. carolinus$ and $P. frontalis$ fireflies.

Skills ──────

Python

Data Science

Agent-Based Modeling

Matlab

C++

git

Processing

Mathematical modeling

Interests

Intellectually and professionally I am interested in collective behavior, complex networks, dynamics on networks, network inference, biological and artificial intelligence, and autonomous swarm systems.

Education

2020– Ph.D. student @ University of Colorado Boulder
Computer Science, advised by Dr. Orit Peleg

2013–17 B.Sc. @ Tufts University
Computer Science

Research

2021-22 Emergent Periodicity in the collective synchronous flashes of fireflies
@ Peleg lab, CU Boulder - https://www.biorxiv.org/content/10.1101/2022.03.09.483608v1.full
Dynamical modeling of flash synchronicity on complex network topologies formed by swarming fireflies

2021-22 Exploring synchronization dynamics of firefly-LED systems
@ Peleg lab, CU Boulder - published in APS proceedings of March Meeting 2022
Understanding individual firefly responses to artificial driving stimuli

2021-22 High throughput ecological monitoring of firefly populations
@ Peleg lab, CU Boulder - in preprint
Classification of firefly species with RNNs

2020 Disease Prevention Measures within Heterogeneous Communities
@ NetCOVID, COMBINE Institute, University of Maryland
Agent-based SIR epidemic modelling of social distancing effectiveness in heterogeneous communities

2019 Data-Driven Modeling of Bee Trophallaxis @ Peleg lab, CU Boulder
Agent-based model of $A. mellifera$ movement and trophallaxis information/food exchange

Work Experience

2020-22 Teaching Assistant and Software Engineer @ University of Colorado Boulder
Asymptotic complexity, data structures concepts and applications, and programming fundamentals in C++; developed and deployed grading software for the course

2018-20 Software Engineer in Test @ NetApp Solidfire
Designed and implemented test automation framework for the performance team. Wrote dev-ops tools to facilitate company-wide test development across a variety of features.

Relevant Coursework

2020-22 Coursework in Computer Science @ CU Boulder
Network Analysis and Modeling, Data Mining, Chaotic Dynamics, Bio-Inspired Multi-Agent Systems, Computational Neuroscience, Issues and Methods in Cognitive Science, Machine Learning for Ecology, Datacenter-scale Computing (F22)

2013-17 Coursework in Computer Science @ Tufts University
Data Structures, Discrete Math, Programming Languages, Machine Structure and Assembly Language Programming, Web Programming, Computational Biology, Computational Theory, Computing for Developing Regions, Artificial Intelligence, Structure and Function of Complex Networks, Machine Learning, Algorithms, User Experience Design