

Craig Fouts, MSc

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ACADEMIC RECORD

Columbia University, MSc

Applied Mathematics 2022 – 2023

Simultaneously worked as a student researcher in the Tech Innovation Lab at the New York Genome Center building probabilistic models for single-cell genomics.

PI: Sanja Vicković / Bianca Dumitrascu

The Ohio State University, BSc

Computer Science / Mathematics 2018 – 2022

Received Honors Research Distinction for research and publication completed in collaboration with the Google Research Differentiable Self-Organizing Systems Group.

PI: Tanya Berger-Wolf

PROFESSIONAL EXPERIENCE

New York Genome Center, Technology Innovation Laboratory

Associate Computational Biologist II Feb 2024 – Present
Visiting Scientist / Student Researcher Sep 2022 – Dec 2023

Developing statistical machine learning tools for genomics research leveraging spatial transcriptomics data. Current work involves designing latent dimensionality reduction schemes that yield interpretable descriptions of genomic mechanisms.

Skills: Statistical Modeling, Probabilistic Machine Learning Tools: PyTorch, Pyro, Scikit-Learn

The Ohio State University, Translational Data Analytics Institute

Student Research Assistant Aug 2021 – Sep 2022

Helped devise a data processing and analysis pipeline used to study the impact of aircraft combustion engines on urban environments. Performed time series aggregation and alignment of multimodal data from an NSF-sponsored sensor array.

Skills: Time Series Alignment / Analysis, Machine Learning Tools: PyTorch, Scikit-Learn, Scipy

The Ohio State University, Driving Simulation Laboratory

Laboratory Researcher Aug 2020 – Sep 2022

Proctored and contributed to driving psychology research involving a Honda-sponsored immersive car simulator. Helped develop software using Trio and the Qt framework for interfacing with our data collection pipeline and networking systems.

Skills: Experimental Research, GUI Design / Development Tools: PyQt, QTriO, Socket

The Ohio State University, Center for Design and Manufacturing Excellence

Student Research Assistant Nov 2018 – Aug 2019

Designed and helped create a software platform for interfacing with a Universal Robots UR10e arm used to autonomously survey sealed radioactive sources. This involved mapping trajectories for the arm and collecting data from its sensor array.

Skills: Robotics Automation, GUI Design / Development Tools: RoboDK, Tkinter

CONFERENCE PUBLICATIONS

Growing Steerable Neural Cellular Automata

Ettore Randazzo, Alexander Mordvintsev, *Craig Fouts* ALife 2023

Introducing angle- and gradient-based steerable adaptations of Neural Cellular Automata for investigating morphogenetic chirality. Demonstrating each model's capacity for producing out-of-training behaviors based on directed initial conditions.

DOI: https://doi.org/10.1162/isal_a_00564

Growing Isotropic Neural Cellular Automata

Alexander Mordvintsev, Ettore Randazzo, *Craig Fouts*

ALife 2022

Presenting an isotropic variant of Neural Cellular Automata for modeling orientation-agnostic morphogenesis. Defining the structured seed paradigm for manipulating initial conditions used to obtain directed out-of-training growth and mutation.

DOI: https://doi.org/10.1162/isal_a_00552



RELEVANT COURSEWORK

Columbia University

2023: Applied Statistics III: Interpretable Machine Learning (A), Machine Learning for Functional Genomics (A), Numerical Methods (A), Advanced Linear Algebra (A+) | 2022: Numerical Algebra / Optimization (A), Partial Differential Equations (A-)

The Ohio State University

2022: Discrete Mathematical Models (A), Quantitative Neuroscience (A), Computer Networking (A), Bio-Math Seminar (S)

2021: Mathematical Statistics (A), Advanced Artificial Intelligence (A), Programming Languages (A), Database Systems (A-)

2020: Data Structures / Algorithms (A), Experimental Physics (A), Intermediate Mechanics (A-), Development / Design (A-)

2019: Ordinary Differential Equations (A), Honors Physics E / M (A) | 2018: Honors Real Analysis (A), Honors Psychology (A)



SELECTED ACCOLADES

Scholarships

2018 – 2023: Licking County Foundation Scholarship | 2021: Honors Engineering Research Scholarship | 2018 - 2022: Ohio State Maximus Scholarship, Battelle Memorial Full-Tuition Scholarship | 2019: Ohio State Mankoff Engineering Scholarship

Competitions

HackOHI/O Hackathon 2021: First Place Grand Prize | Ohio State FEH Honors Robotics Competition 2019: Second Place Outstanding Achievement in Innovation | OMEA Solo / Ensemble 2016 – 2017: Rank One Class A Violin Solo Performance