

Craig Fouts

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I am an enthusiastic **scientist/engineer** interested in building mathematical descriptions of living systems and studying the dynamics of emergent behavior in the context of biomedical data.

EDUCATION

Imperial College London | PhD

Computational Systems Biology 2025 –

Developing a computational framework for modeling holobiont dynamics. Current work involves building an archetypal microbiome in situ that exhibits underlying design principles and structural motifs found in stable host-microbiome ecosystems.

Columbia University | MSc

Applied Mathematics 2022 – 2023

The Ohio State University | BSc

Computer Science & Mathematics 2018 – 2022

Received honors research distinction for research and publication in collaboration with Google Research.

EXPERIENCE

Uppsala University | Department of Immunology, Genetics, and Pathology

Computational Research Engineer Oct 2024 – Sep 2025

Developed a nonparametric topic model called PriorLDA that identifies anatomical structures and pathologies in single-cell datasets based on gene expression profile and spatial distribution. Using a mixture-of-finite-mixtures approach, the model estimates the number of spatially relevant topics for semantic segmentation.

New York Genome Center | Technology Innovation Laboratory

Associate Computational Biologist II Feb 2024 – Sep 2024

Graduate Research Assistant Sep 2022 – Dec 2023

Developed a probabilistic dimensionality reduction model called sceLDA that clusters anatomical structures in histological spinal cord datasets based on cell type composition and spatial distribution. The model is part of a spatial transcriptomics pipeline that repurposes Illumina HiSeq 2500s as accessible imaging platforms.

The Ohio State University | Translational Data Analytics Institute

Student Research Assistant Aug 2021 – Sep 2022

Developed a computational pipeline for aggregating and analyzing multimodal data collected from environmental sensors used to study the effects of aircraft combustion engines in urban neighborhoods. The pipeline uses dynamic time warping to align several data streams based on location and ambient wind conditions.

ACCOLADES

Honors

The Ohio State University: Magna Cum Laude | Honors Research Distinction 2022

Granville High School: Cum Laude Society | National Honor Society | Sociedad Honoraria Hispánica 2017

Scouting America: Eagle Scout 2016

Competitions

HackOHI/O Hackathon: 1st Place Grand Prize | Microsoft Challenge Winner | People's Choice Award 2021

Ohio State FEH Honors Robotics Competition: 2nd Place Outstanding Achievement in Innovation 2019

OMEA Solo & Ensemble: Rank 1 Class A Violin Solo Performance 2016 & 2017

COURSEWORK

Columbia University

Applied Statistics III (A), Machine Learning for Functional Genomics (A), Advanced Linear Algebra (A+) **2023**
Numerical Algebra & Optimization (A), Partial Differential Equations (A-) **2022**

The Ohio State University

Discrete Mathematical Models (A), Quantitative Neuroscience (A), Computer Networking (A) **2022**
Mathematical Statistics II (A), Advanced Artificial Intelligence (A), Programming Languages (A) **2021**
Data Structures & Algorithms (A), Experimental Physics (A), Intermediate Mechanics (A-) **2020**
Ordinary Differential Equations (A), Honors Physics Electricity & Magnetism (A) **2019**
Honors Real Analysis (A), Honors Psychology (A) **2018**

PUBLICATIONS

Growing Steerable Neural Cellular Automata

Ettore Randazzo, Alexander Mordvintsev, **Craig Fouts** (2023). *Growing Steerable Neural Cellular Automata*. Proceedings of ALIFE 2023: The 2023 Conference on Artificial Life. https://doi.org/10.1162/isal_a_00564

Growing Isotropic Neural Cellular Automata

Alexander Mordvintsev, Ettore Randazzo, **Craig Fouts** (2022). *Growing Isotropic Neural Cellular Automata*. Proceedings of ALIFE 2022: The 2022 Conference on Artificial Life. https://doi.org/10.1162/isal_a_00552