

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

Columbia University | MSc

Applied Mathematics

2022 – 2023

Completed a graduate research internship in the Tech Innovation Lab at the New York Genome Center.

The Ohio State University | BSc

Computer Science & Mathematics

2018 – 2022

Received honors research distinction for research and publications co-authored with Google Research.

EXPERIENCE

Uppsala University | Department of Immunology, Genetics, and Pathology

Computational Research Engineer

Oct 2024 –

Developing 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.

PUBLICATIONS

Growing Steerable Neural Cellular Automata

Ettore Randazzo, Alexander Mordvintsev, & **Craig Fouts**. 24 – 28 July 2023. “Growing Steerable Neural Cellular Automata.” Presented at ALIFE 2023. https://doi.org/10.1162/isal_a_00564

Growing Isotropic Neural Cellular Automata

Alexander Mordvintsev, Ettore Randazzo, & **Craig Fouts**. 18 – 22 July 2022. “Growing Isotropic Neural Cellular Automata.” Presented at ALIFE 2022. https://doi.org/10.1162/isal_a_00552

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

Scholarships

Battelle Memorial Institute Full Tuition Award | Honors Engineering Research Award | Ohio State Maximus Award | Ohio State Mankoff Engineering Award | Raymond H. and Beryl Dean Penick Memorial Award

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