

# Craig Fouts

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

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## EDUCATION

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### 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 publication completed with Google Research.

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## EXPERIENCE

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### Uppsala University | Department of Immunology, Genetics, and Pathology

Computational Research Engineer

Oct 2024 – Present

Developing mathematical models and machine learning tools that facilitate genomics research using single-cell and spatial transcriptomics data. Current work involves building a nonparametric topic model for identifying pathologies in single-cell datasets based on gene expression profile and spatial distribution.

### 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 wind conditions.

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## PUBLICATIONS

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### Growing Steerable Neural Cellular Automata

Ettore Randazzo, Alexander Mordvintsev, **Craig Fouts**. July 24–28, 2023. "Growing Steerable Neural Cellular Automata." Proceedings of ALIFE 2023: The 2023 Conference on Artificial Life. [https://doi.org/10.1162/isal\\_a\\_00564](https://doi.org/10.1162/isal_a_00564)

### Growing Isotropic Neural Cellular Automata

Alexander Mordvintsev, Ettore Randazzo, **Craig Fouts**. July 18–22, 2022. "Growing Isotropic Neural Cellular Automata." Proceedings of ALIFE 2022: The 2022 Conference on Artificial Life. [https://doi.org/10.1162/isal\\_a\\_00552](https://doi.org/10.1162/isal_a_00552)

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## ACCOLADES

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### Honors

<b>The Ohio State University:</b> Magna Cum Laude   Honors Research Distinction	<b>2022</b>
<b>Granville High School:</b> Cum Laude Society   National Honor Society   Sociedad Honoraria Hispánica	<b>2017</b>
<b>Boy Scouts of America:</b> Eagle Scout	<b>2016</b>

### Competitions

<b>HackOHI/O Hackathon:</b> 1st Place Grand Prize   Microsoft Challenge Winner   People's Choice Award	<b>2021</b>
<b>Ohio State FEH Honors Robotics Competition:</b> 2nd Place Outstanding Achievement in Innovation	<b>2019</b>
<b>OMEA Solo &amp; Ensemble:</b> Rank 1 Class A Violin Solo Performance	<b>2016 &amp; 2017</b>

### 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

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## COURSEWORK

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### Columbia University

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

### The Ohio State University

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