# Craig Fouts, MSc

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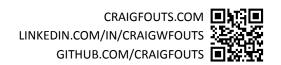GITHUB.COM/CRAIGFOUTS

## EDUCATION

### Columbia University – MSc

Applied Mathematics                2022 – 2023

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

**PI:** Sanja Vicković & Bianca Dumitrascu

### The Ohio State University –BSc

Computer Science & Mathematics        2018 – 2022

Received **honors research distinction** for research and publication completed with Google Research.

**PI:** Tanya Berger-Wolf

## EXPERIENCE

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

Machine Learning Engineer                                    Oct 2024 – Present

Developing mathematical models and statistical machine learning tools to facilitate genomics research using single-cell and spatial transcriptomics data.

**Proficiencies:** Python (PyTorch, Pyro, Scikit-Learn), statistical modeling, probabilistic machine learning

### New York Genome Center – Technology Innovation Laboratory

Associate Computational Biologist II                        Feb 2024 – Sep 2024
Graduate Student Research Intern                             Sep 2022 – Dec 2023

Developed a probabilistic clustering model for elucidating cell state mixtures associated with degenerative neuromuscular diseases using single-cell spinal data.

**Proficiencies:** Python (PyTorch, Pyro, Scikit-Learn), statistical modeling, probabilistic machine learning

### The Ohio State University – Translational Data Analytics Institute

Student Research Assistant                                   Aug 2021 – Sep 2022

Developed a computational pipeline for performing aggregation and time-series analysis of multimodal data collected to study the effects of combustion engines on urban environments.

**Proficiencies:** Python (PyTorch, Scikit-Learn, Scipy), time series alignment & analysis

### The Ohio State University – Driving Simulation Laboratory

Laboratory Researcher                                        Aug 2020 – Sep 2022

Proctored simulated driving psychology experiments and developed a graphical software platform for interfacing with our proprietary data analysis and networking systems.

**Proficiencies:** Python (PyQt, QTrio, Socket), experimental research, graphical software development

### The Ohio State University – Center for Design and Manufacturing Excellence

Student Research Assistant                                   Nov 2018 – Aug 2019

Developed a graphical software platform for interfacing with a Universal Robots UR10e industrial arm used to automate surveys of radioactive sources in a controlled environment.

**Proficiencies:** Python (RoboDK, Tkinter), graphical software development, robotics automation

## PUBLICATIONS

**Hudson: An Ecosystem for High-Throughput Optical Mapping using Decommissioned Sequencers\***

*manuscript in preparation                                                Nature Methods TBD

**PriorLDA: Topic Modeling with Encoded Spatial Priors**

**Craig Fouts**                                                                              ArXiv 2024

**Growing Steerable Neural Cellular Automata**

Ettore Randazzo, Alexander Mordvintsev, **Craig Fouts**              Artificial Life Conference 2023

**Growing Isotropic Neural Cellular Automata**

Alexander Mordvintsev, Ettore Randazzo, **Craig Fouts**              Artificial Life Conference 2022

## 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

**Boy Scouts of 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