Craig Fouts, MSc

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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 Research Assistant Sep 2022 – Dec 2023

Developed a probabilistic dimensionality reduction 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 TBD 2025

PriorLDA: Topic Modeling with Encoded Spatial Priors*
*manuscript in preparation TBD 2025

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