Nicholas Franzese

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EXPERIENCE

Northwestern University, Evanston IL — *Graduate Research Assistant*
August 2020 - Present
I am working on methods for secure multiparty computation and oblivious RAM, advised by professor Xiao Wang.

University of Maryland, College Park MD — *Graduate Research Assistant*
June 2018 - August 2020
I worked with UMD professor Max Leiserson to design novel machine learning methods for mutational signature analysis.

Reed College, Portland OR — *Research Assistant*
Fall 2017
I worked with Reed College professor Anna Ritz to complete a manuscript detailing a novel algorithm for the investigation of protein interactome hypergraphs.

Virginia Tech, Blacksburg VA — *Research Assistant*
June - August 2017
I worked under professor T. M. Murali of the Virginia Tech CS department. Responsibilities included proof writing, algorithm design, and analysis of protein interactome hypergraphs.

Reed College, Portland OR — *Teaching Assistant*
Fall 2015 - Spring 2017
I was a TA for Math 121: Introduction to Computing. Responsibilities included grading assignments and 4-6 hours of working closely with students per week.

Reed College, Portland OR — *Research Assistant*
July - August 2016
I informally conducted research with Reed College professor Anna Ritz. My work in this period consisted primarily of investigating hypergraph theory and writing code for statistical analysis of biological data hypergraphs.

University of South Florida, Tampa FL — *Research Assistant*
Summers, 2011 - 2013
I worked under Dr. Cesar Borlongan of the USF Neurosurgery department. Responsibilities included paper writing, surgery assistance, lab assistance, and animal care.

EDUCATION

Northwestern University — *Computer Science Phd Student (Ongoing)*
September 2020 - PRESENT

EDUCATION

University of Maryland — *MS in Computer Science*
September 2018 - May 2020

Reed College — *interdisciplinary BA in Biology and Mathematics with Computer Science concentration*
August 2012 - May 2017

SELECTED PUBLICATIONS

First author, "Hypergraph-based connectivity measures for signaling pathway topologies." *PLoS Computational Biology*. 2019. doi: 10.1371/journal.pcbi.1007384.

First author, "Connectivity Measures for Signaling Pathway Topologies." *GLBio*. 2019. doi: 10.1101/593913.

Co-author, "CrossPlan: Systematic Planning of Genetic Crosses to Validate Mathematical Models." *Bioinformatics*. 2018 Jul 1;34(13):2237-2244. doi: 10.1093/bioinformatics/bty072.

Co-author, "Stem cell-like dog placenta cells afford neuroprotection against ischemic stroke model via heat shock protein upregulation." *PLoS One*. 2013 Sep 25;8(9):e76329. doi: 10.1371/journal.pone.0076329.

AWARDS

National Science Foundation Graduate Research Fellowship - 2020

National Institutes of Health Cancer Research Training Award - 2019

University of Maryland *Year of Data Science* Summer Fellowship - 2019

ADDITIONAL PROJECTS

Undergraduate Thesis - year long research project during which I formulated a novel algorithm for the analysis of biological network hypergraphs. Advised by Reed College professors Adam Groce and Anna Ritz.

Proof: 2-Hypergraph Shortest Hyperpath is NP-hard - Hardness result for a previously uncharacterized special case of the shortest hyperpath problem. Written as part of my research with Anna Ritz. https://www.overleaf.com/read/yvrqdngdwtwp