

Nicholas Franzese

PHD STUDENT · NORTHWESTERN UNIVERSITY

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Education

Northwestern University

PHD COMPUTER SCIENCE (ONGOING)

- Advisor: Xiao Wang

Evanston, IL

Sept 2020 - present

University of Maryland

MS COMPUTER SCIENCE

- Advisor: Max Leiserson

College Park, MD

Aug 2018 - May 2020

Reed College

BA COMPUTER SCIENCE / BIOLOGY INTERDISCIPLINARY

- Thesis Advisors: Anna Ritz, Adam Groce

Portland, OR

Aug 2012 - May 2017

Professional Experience

- 2020-Curr. **Graduate Research Assistant (NSF GRFP)**, Northwestern University
Fall 2021 **Graduate Teaching Assistant**, Northwestern University
2019-2020 **Graduate Research Assistant (NIH CRTA)**, National Institutes of Health & University of Maryland
2018-2019 **Graduate Teaching Assistant**, University of Maryland
2017 **Post-Bac Research Assistant**, Virginia Tech & Reed College
2015-2017 **Undergraduate Teaching Assistant**, Reed College
2016 **Undergraduate Summer Research Assistant**, Reed College
2011-2013 **High School & Undergraduate Summer Research Assistant**, University of South Florida

Publications

PUBLISHED (COMPUTER SCIENCE)

- Franzese N**, Katz J, Lu S, Ostrovsky R, Wang X, Weng C. 2021. Constant-Overhead Zero-Knowledge for RAM Programs. ACM Conference on Computer and Communications Security, 178-191.
- Franzese N**, Fan J, Sharan R, Leiserson M. 2022. Scalpelsig Designs Targeted Genomic Panels from Data to Detect Activity of Mutational Signatures. Journal of Computational Biology, 29(1): 56-73.
- Franzese N**, Groce A, Murali TM, Ritz A. 2019. Hypergraph-based connectivity measures for signaling pathway topologies. PLoS Computational Biology. 15(10): e1007384.
- Pratapa A, Adames N, Kraikivski P, **Franzese N**, Tyson J, Peccoud J, Murali TM. 2018. CrossPlan: systemic planning of genetic crosses to validate mathematical models. Bioinformatics. 34(13): 2237-2244.

IN REVIEW

- Franzese N**, Dzedzic A, Thomas M, Kaleem MA, Rabanser S, Choquette-Choo C, Jha S, Papernot N, Wang X. In Review. Secure, Robust, and Fully Distributed P2P Learning. USENIX Security.

OTHER

- Franzese N**. 2017. Examining the Practicality of Shortest Hyperpaths for Signaling Pathway Analysis: The Cheating Hyperpath Algorithm as an Alternative Approach. Undergraduate Thesis, Reed College.

PUBLISHED (WET-LAB BIOLOGY)

- Ishikawa H, Caputo M, **Franzese N**, Weinbren NL, Slakter A, Patel M, Stahl CE, Jacotte MA, Acosta S, Franyuti G, Shinozuka K. 2013. Stroke in the eye of the beholder. *Medical hypotheses*. 80(4):411-5.
- Acosta SA, **Franzese N**, Staples M, Weinbren NL, Babilonia M, Patel J, Merchant N, Simancas AJ, Slakter A, Caputo M, Patel M. 2013. Human umbilical cord blood for transplantation therapy in myocardial infarction. *Journal of stem cell research & therapy*. Suppl 4.
- Yu S, Tajiri N, **Franzese N**, Franzblau M, Bae E, Platt S, Kaneko Y, Borlongan CV. 2013. Stem cell-like dog placenta cells afford neuroprotection against ischemic stroke model via heat shock protein upregulation. *PLoS One*. PLoS One. 8(9):e76329.
- Kaneko Y, Tajiri N, Yu S, Hayashi T, Stahl CE, Bae E, Mestre H, **Franzese N**, Rodrigues Jr A, Rodrigues MC, Ishikawa H. 2012. Nestin overexpression precedes caspase-3 upregulation in rats exposed to controlled cortical impact traumatic brain injury. *Cell Medicine*. 4(2), 55-63.

Awards, Fellowships, & Grants

- 2020 **Graduate Research Fellowship Program (NSF GRFP)**, National Science Foundation
- 2019 **Cancer Research Training Award (CRTA)**, National Institutes of Health
- 2019 **Year of Data Science Summer Fellowship**, University of Maryland

Conference Presentations

(presenting author: *)

- Franzese N***, Katz J, Lu S, Ostrovsky R, Wang X, Weng C. 2021. Constant-Overhead Zero-Knowledge for RAM Programs. *ACM Conference on Computer and Communications Security*, 178-191.
- Franzese N***, Fan J, Sharan R, Leiserson M. 2021. Scalpelsig Designs Targeted Genomic Panels from Data to Detect Activity of Mutational Signatures. *RECOMB*, 29(1): 56-73.
- Franzese N**, Groce A, Murali TM, Ritz A*. 2019. Hypergraph-Based Connectivity of Signaling Pathway Topologies. *Great Lakes Bioinformatics Conference (GLBio)*.

Teaching Experience

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|----------------------------|---|---------------------|
| Fall 2021 | Introduction to Cryptography , Teaching Assistant | <i>Northwestern</i> |
| Spring 2019 | Object Oriented Programming II , Teaching Assistant | <i>UMD</i> |
| Fall 2018 | Object Oriented Programming I , Teaching Assistant | <i>UMD</i> |
| Fall 2015 - Spring 2017 | Computer Science Fundamentals I , Undergraduate Teaching Assistant | <i>Reed College</i> |

Research Experience & Interests

Northwestern University

Evanston, IL

ADVISOR: XIAO WANG

Sept 2020 - Present

- Topics: applied cryptography: low-level optimization in secure multiparty computation and zero-knowledge proofs, cryptography applied towards trustworthy machine learning.

University of Maryland

College Park, MD

ADVISOR: MAX LEISERSON

2018-2020

- Topics: computational biology, machine learning: detection of statistical patterns in genome mutations for cancer diagnosis.

Reed College & Virginia Tech

Portland, OR

ADVISORS: ANNA RITZ, ADAM GROCE, TM MURALI

2016-2017

- Topics: computational biology, algorithm design: signaling pathway discovery via computational methods on protein interaction hypergraphs.

Outreach & Professional Development

SERVICE AND OUTREACH

2022 **“Life as a Graduate Student” Panel**, Panelist

Reed College

2021 **Queer Pride Graduate Student Association**, Queertopia Conference Co-Chair

Northwestern

2018 **Paideia**, 2-part lecture on P vs NP

Reed College

PEER REVIEW

Transactions on Dependable and Secure Computing

RECOMB 2020

ISMB/ECCB 2019

PROFESSIONAL MEMBERSHIPS

International Association for Cryptologic Research (IACR)