ZORIAN THORNTON

Ph.D Student, Genome Sciences, Seattle,WA
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EDUCATION

University of Washington - Seattle,WA *Sep. 2019 - Present*
Ph.D Student in Genome Sciences

Virginia Tech - Blacksburg,VA *Aug. 2015 - May 2019*
B.Sc Statistics

Virginia Tech - Blacksburg,VA *Aug. 2015 - May 2019*
B.Sc Computational Modeling and Data Analytics

Minors in Mathematics and Computer Science

RESEARCH EXPERIENCE

Fred Hutchison Cancer Research Center *Seattle, WA*
Doctoral Candidate, advised by Frederick Matsen IV *July 2021 - Present*

- Developing `torchdms`: a flexible modeling framework for fitting neural networks with PyTorch to deep mutational scanning experiments. The goal of `torchdms` is to infer a *fitness landscape* that accurately predicts quantitative phenotypes of unseen protein variants while preserving biophysically interpretable parameters.

Fred Hutchison Cancer Research Center *Seattle, WA*
Doctoral Student, advised by Frederick Matsen IV *June 2020 - July 2021*

- Developing and fitting neural network models to predict protein variant phenotypes from deep mutational scanning experiments to accurately predict fitness of unseen variants and infer the shape of global epistasis.

University of Washington Department of Genome Sciences *Seattle, WA*
Lab Rotation with Brian Beliveau *March 2020 - June 2020*

- Implemented a bioinformatics pipeline for the design of split-oligo probes for fluorescence *in situ* hybridization (FISH) experiments to enable fast and affordable design of highly-specific RNA FISH probes.

Fred Hutchison Cancer Research Center *Seattle, WA*
Lab Rotation with Frederick Matsen IV *Jan. 2020 - March 2020*

- *See related entry above*

University of Washington Department of Genome Sciences *Seattle, WA*
Lab Rotation with William S. Noble *Sept. 2019 - Dec. 2019*

- Implemented a novel method for systematically finding potential functional inter-chromosomal contacts in Hi-C data.

Virginia Tech Department of Statistics *Blacksburg, VA*
Undergraduate Research with Allison Tegge *Aug. 2018 - May 2019*

- Implemented Self-Organizing Maps and conducted survival analysis to identify genes and pathways associated with progression of colorectal cancer from patients included in The Cancer Genome Atlas Program.

Virginia Tech Department of Statistics *Blacksburg, VA*
Undergraduate Research with Leah Johnson *Aug. 2017 - May 2019*

- Developed a new formula for the disease basic reproductive number, R_0, to include temperature sensitive midge life history traits to predict potential regions for the spread of Bluetongue viral disease.

University of Washington Department of Genome Sciences *Seattle, WA*
Undergraduate Research with Jim Bruce *June. 2017 - Aug. 2017*

- Visualized inter-surface regions of cross-linked proteins and built probabilistic models to quantify competition between proteins for linkage with other proteins to help scientists characterize protein function, discover mutations, and discover protein-protein interactions to tackle molecular challenges such as cancer

PUBLICATIONS

- Yu, T., **Thornton, Z.**, Hannon, W., DeWitt, W.S., Radford, C., Matsen IV, F.A. and Bloom, J.D. (2022). A biophyscial model of viral escape from polyclonal antibodies *Virus Evolution*, 8(2), veac110.
- El Moustaid, F., **Thornton, Z.**, Slamani, H., Ryan, S. and Johnson, LR (2021). Predicting temperature-dependent transmission suitability of bluetongue virus in livestock. *Parasites Vectors*, 14(1), pp.1-14..
- Keller, A., Chavez, J.D., Eng, J.K., **Thornton, Z.** and Bruce, J.E. (2018). Tools for 3D Interactome Visualization. *Journal of proteome research*, 18(2), pp.753-758.

RESEARCH PRESENTATIONS

- Zorian Thornton, *Predicting Disease Progression of Colorectal Cancer via Self-Organizing Maps*, RECOMB 2019, George Washington University, Washington DC, May 2019
- Zorian Thornton, *Modeling Bluetongue Virus via Markov Chain Monte Carlo Methods*, Student Experiential Learning Conference, Virginia Tech, Blacksburg, VA, Apr. 2018
- Zorian Thornton, *Viewing Molecular Interaction Interfaces Through Directed Computational Methods*, Department of Genome Sciences Research Symposium, University of Washington, Seattle, WA, Aug. 2017

WORK EXPERIENCE

Adaptive Biotechnologies *Seattle, WA*
Machine Learning Computational Biology Intern *June 2022 - Sept. 2022*

- Conducted benchmarking of semi-supervised learning methods for predicting T-cell receptor specificity from high-throughput sequencing data.

Virginia Tech Statistical Applications and Innovations Group *Blacksburg, VA*
Associate Collaborator *June 2019 - Sept. 2019*

- Assistant statistics consultant to Virginia Tech graduate students and faculty.

Virginia Tech Department of Statistics *Blacksburg, VA*
Course Development Contributor for Dr. Christian Lucero *May. 2019 - June 2019*

- Assisted in writing of lectures, and homework assignments for an introductory machine learning class: Introduction to Data Analysis and Visualization (CMDA 3654)

Virginia Tech Department of Statistics *Blacksburg, VA*
Grader for Dr. Jane Robertson Evia *Aug. 2018 - May 2019*

- Statistics for Social Science (STAT 3604)

Nielsen *Chicago, IL*
Data Science Intern *June 2018 - Aug. 2018*

- Implemented statistical framework to identify possible errors in scanned receipt data and implemented pipeline to attempt to correct errors

Virginia Tech Math Emporium *Blacksburg, VA*
Instructional Assistant *Jan. 2017 - Aug. 2018*

- Teaching assistant for introductory math courses including differential and integral calculus, graph theory, differential equations, and linear algebra

HONORS

National Science Foundation Graduate Research Fellowship Program *Awarded 2020*

- Honorable mention

Mu Sigma Rho, National Honor Society *Inducted April 2019*

- National honorary society for statistics whose purpose is the promotion and encouragement of scholarly activity in statistics, and the recognition of outstanding achievement among the students and instructional staff in eligible academic institutions.

College of Science Dean's Roundtable Scholarship, Virginia Tech *Aug. 2018 - May 2019*

- Merit-based scholarship awarded annually to four students who are and will continue to be excellent representatives of the College of Science

Luther and Alice Hamlett Undergraduate Research Grant *Aug. 2018 - May 2019*

- Selective research grant awarded to Virginia Tech undergraduates conducting research in the Academy of Integrated Sciences

Fralin Undergraduate Research Fellowship *Aug. 2017 - May 2018*

- Selective fellowship awarded to Virginia Tech undergraduates conducting research involving the life sciences

Eckert Statistics Scholar, Virginia Tech *Jan. 2016 - May 2019*

- Three-year scholarship awarded annually to two Statistics majors for academic excellence

PROGRAMMING LANGUAGES, TOOLS, AND CONCEPTS

Preferred Programming Languages	Python, R, C/C++
HPC Tools	CUDA, MPI, openMP, SLURM
Dev Tools & Environments	Git, VSCode, Jupyter
Other Programming Languages	Java, MATLAB, SQL

PROFESSIONAL ORGANIZATIONS

- The American Association of Immunologists member since 2020
- National Society of Blacks in Computing member since 2017
- American Statistical Association member since 2016
- National Society of Black Engineers member since 2016