Madeline Hughes

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EDUCATION

Brown University, Providence, RI *(grad year: 2022)* **Majors:** Computer Science A.B. and Biology A.B. **GPA:** 3.9/4.00

Relevant Coursework: (Computer Science): Deep Learning, Machine Learning, Computational Biology (Math): Quantitative Models of Biological Systems, Linear Algebra, Statistical Inference, Differential Equations (Biology): Genetics, Virology, Infectious Disease (Chemistry): Organic Chemistry (I and II), Biochemistry

Programming Languages/Tools: Python, R, Java, Bash (Unix shell), Pytorch, TensorFlow, Git, HTML, LaTeX, SQL

PUBLICATIONS & PROJECTS

1. C. Nwizu, **M. Hughes,** M. Ramseier, A. Navia, A. Shalek, N. Fusi, S. Raghavan, P. Winter, A. Amini, L. Crawford. *Scalable nonparametric clustering with variable selection for single-cell RNA-seq data.* Preparing Manuscript for Publication.

2. G. Murtza, A. Jain, **M. Hughes**, T. Varatharajan, R. Singh (2021). *Investigating the Performance of Deep Learning Methods for Hi-C Resolution Improvement.* Manuscript Submitted for Publication.

3. **M. Hughes**, D. Hawkins, K. McCutcheon, A. Glick, N. Rodriguez-Sastre, and C. Bradham (2021). *A Pipeline for Constructing a 3D Coordinate Map of Primary Mesenchyme Cells in Developing Embryos.* Project presented at the Annual Biomedical Research Conference for Minority Students (ABRCMS) 2021

AWARDS

1. Spring 2022 and Summer 2021 Brown University Undergraduate Teaching and Research Awardee for research with the Singh Lab

RESEARCH EXPERIENCE

BioMedical Machine Learning Team, Microsoft Research, Cambridge, MA - Research Assistant *07/2022 - present*

- Project *Ex Vivo*: collaborate with researchers at Microsoft and the Broad Institute at MIT and Harvard to develop a more comprehensive, system-level representation of tumors *ex vivo* and improve patient outcomes with precision oncology

Singh Lab, Brown University, Providence RI - Undergraduate Research Assistant *01/2021 - 05/2022*

- Construct a graph neural network for improving the quality and interpretability of Hi-C data
- Conduct a computational study on deep learning models that aim to improve resolution of Hi-C data

Bradham Lab, Boston University BRITE REU, Boston, MA - Computational Biology Lab Intern *06/2021 - 09/2021*

- Implement a pipeline that constructs a 3D coordinate system onto which we can map volumetric images of primary mesenchyme cells in developing sea urchin embryos for more robust, quantitative spatial analyses

Naik Lab, Brown University, Providence, RI - Undergraduate Research Assistant *09/2019 - 04/2020*

- Conduct a structural study on the SUMO binding orientation of Daxx SIM using NMR spectroscopy and computational tools to aid in the development of therapeutic inhibitor molecules

Correa Lab, New England Biolabs, Ipswich, MA - Biochemistry Lab Intern *06/2019 - 08/2019*

- Execute chemical and enzymatic transformations of oligonucleotides, including their purification and analysis

Tenen Lab, Beth Israel Deaconess Medical Center, Boston, MA - Remote Lab Intern *06/2020 - 12/2020*

- Write a literature review on Acute Myeloid Leukemia and generate an EndNote citation library

VOLUNTEER EXPERIENCE

Connect for Health, Providence, RI - Campus Coordinator, Leadership Team *06/2020 - 05/2022*

- Manage outreach and recruitment of student advocates at Brown University, RIC, and PC
- Organize and lead advocate development meetings and trainings to improve advocate skills and experience

Women in Science and Engineering, Providence, RI - Mentor *09/2018 - 05/2022*

- Mentor other undergraduate students in STEM and attend meetings and workshops to improve mentor abilities

Connect for Health, Providence, RI - Advocate *08/2018 - 08/2020*

- Help people in Rhode Island access resources related to housing, food, healthcare, financial assistance, and other needs