Inle Myat Bush

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Education

Cornell University   2021 - 2025
B.A. in Computer Science, B.A. in Mathematics, & B.A. in Biology

Experience

Han Lab, Cornell University   02/2022 - Present
Research Assistant

- Computational and optogenetic dissection of dendrite morphogenesis
  - Developed 10+ computer vision and data analysis pipelines for analysis of time-lapse images of dendrite development (preprocessing, registration, segmentation, skeletonization, quantification, analysis and visualization) in Java, Python.
  - Coauthored 1 paper and 1 book chapter on methods developed.
- Mechanisms of synapse pruning in *Drosophila* olfactory receptor neurons
  - Designed and led investigation of cellular mechanisms and behavioral implications of excitation induced synapse pruning.

Navlakha Lab, Cold Spring Harbor Laboratory   01/2022 - Present
Research Intern

- Modeled network dynamics of neuromuscular junction connectome development. Analysis of connectome data, simulation, mathematical analysis of dynamical systems.
- Quantified and modeled network dynamics in *Arabidopsis* root systems
  - Lead quantification of time-lapse videos of *Arabidopsis* root network branching structure dynamics.
  - Formalized plant root foraging in inverse reinforcement learning framework.

Su Lab, Colorado University Boulder   05/2019 - 08/2019
Research Intern

- Full time summer intern in genetics and cancer research, studying tumor culling mechanisms during development in *Drosophila melanogaster*.
- Coauthored paper published in *PLOS Genetics* (Recognized as second author).

Design and Analysis of Algorithms Course Staff, Cornell University   05/2023 - Present
Teaching Assistant

- Held 4hr/week of office hours and online tutoring. Administered and graded algorithm design problem sets and exams.

Publications and Manuscripts

1. (Submitted, under review) Dasgupta S., Meirovitch Y., Zheng X., **Bush, I.**, Lichtman J., Navlakha S. (2023). A neural algorithm for computing bipartite matchings

2. (Submitted, under review) Xu Y., Wang B. **Bush, I.**, Saunders H.A., Wildonger J., Han C. (2023). Light-induced trapping of endogenous proteins reveals spatiotemporal roles of microtubule and kinesin-1 in dendrite patterning of Drosophila sensory neurons

3. Xu Y., **Bush, I.**, Han C. (2023). Visualization and Measurement of Dendrite Arborization in Neurons. *Neuronal Morphogenesis - Methods and Protocols*

4. Brown, J., **Bush, I.**, Bozon, J., & Su, T. T. (2020). Cells with loss-of-heterozygosity after exposure to ionizing radiation in Drosophila are culled by p53-dependent and p53-independent mechanisms. *PLOS Genetics*, 16(10). [doi:10.1371/journal.pgen.1009056](https://doi.org/10.1371/journal.pgen.1009056)

Selected Projects

- **RNAFoldml** (Cornell CS 3110 Functional Programming) OCaml package that enables users to input both RNA sequences in FASTA format and a set of constraints to predict RNA secondary structure.

- **State Space Models for CRE Functional Classification** (Cornell CS 4775 Computational Genomics) Implemented and benchmarked SOTA deep learning architectures on genomic classification tasks.

- **Score!: Database and API** (Cornell CS 1998 Backend Development) Core contributor to SQL database and Flask (Python) API backend for college sports IOS app.

Technical Skills

Programming Languages: Python, R, Java, C, C++, Ocaml, Julia, Matlab, JavaScript, SQL, HTML/CSS, IJM, Javascript

Libraries/Frameworks: Pytorch, NumPy, SciPy, Pandas, MatplotLib, SkLearn, Flask, Jupyter, Maven, Postman, Git, JUnit, ImageJ, Microsoft Office, Dev. Tools (VS Code, Eclipse, IntelliJ, RStudio)

Bioinformatics: Sequence Alignment (BLAST, Clustal, Opfi), Databases (IMG, NCBI, PDB), UCSC, PyMol

Experimental Techniques: *Drosophila* husbandry and genetics; immunohistochemistry; tissue dissection; confocal microscopy; PCR; DNA and protein sequence analysis.

Languages: English, French, Burmese (beginner).

Honors

NSF Scholar, Cold Spring Harbor Laboratory Undergraduate Research Program	2023
Grant Recipient, Einhorn Discovery Grant	2022
Best Overall Prize, Cornell AppDev Hack Challenge	2021
Sponsor Prize, Cornell BRH Hackathon	2021
Dean's List, Cornell College of Arts and Sciences	*all semesters*

Selected Coursework

- Machine Learning
- Reinforcement Learning
- Mathematical Statistics
- Backend Development
- Analysis of Algorithms
- Matrix Computations
- Numerical Analysis of Diff. Eq.
- Object Oriented programming
- Neuroscience
- Cellular & Developmental Bio.
- Computational Genetics
- Genetics Lab & Lec.