Bernard Moussad

CS PhD Student in Machine Learning
and Bioinformatics

Virginia Tech
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▬▬▬ Research experience

2022-present	Graduate Research Assistant (VT)
	Bhattacharya Lab, **Blacksburg, VA**
	PI : Debswapana Bhattacharya
2021-2021	Research Assistant (AU)
	Bhattacharya Lab, **Auburn, AL**
	Investigation of Molecular Visualization
	PI : Debswapana Bhattacharya
2020-2020	BioTrain Intern
	HudsonAlpha, **Huntsville, AL**
	Applied machine learning models to predict alignment coverage on DNA sequences
	Mentor : J. Matthew Holt, PhD

▬▬▬ Fellowships/Honors

2023	**Walts Fellowship**
	Virginia Tech, Blacksburg, VA
	Duration of 1 year
2022	**Davenport Leadership Scholarship**
	Virginia Tech, Blacksburg, VA
	Duration of 1 year
2016-2020	**Dean's List**
	Auburn University, Auburn, AL
2016-2020	**Spirit of Auburn Presidential Scholarship**
	Auburn University, Auburn, AL

Publications

[1] **EquiPNAS**   Machine Learning method based on an Equivariant Graph Neural Network that is capable of predicting Protein-DNA/RNA binding sites
https://doi.org/10.1101/2023.09.14.557719

[2] **The transformative power of transformers in protein structure prediction**   Large-scale study of state of the art protein structure prediction methods

https://doi.org/10.1073/pnas.1306447110

[3] **EquiPPIS**   Machine Learning method based on an Equivariant Graph Neural Network that is capable of predicting Protein-Protein binding sites
https://doi.org/10.1371/journal.pcbi.1011435

[4] **Contact-Assisted Threading in Low-Homology Protein Modeling**   An overview of the state of protein threading approaches for protein structure prediction

https://doi.org/10.1007/978-1-0716-2974-1_3

[5] **DisCovER**   A distance- and orientation-based covariational threading method for weakly homologous proteins
https://doi.org/10.1002/prot.26254

Expertise

Protein Structure Prediction	AlphaFold2, ESMFold, RoseTTAFold, OmegaFold
Code	Python, C++, C, Java, MatLab, YAML - Data analysis and software development PyTorch, TensorFlow, PyTorch Lightning - Machine Learning Git - collaborative work Docker, CI/CD (Jenkins) Shell, Linux

Interests

Fields	Protein Structure Prediction, Protein-DNA/RNA interaction, DNA/RNA Structure Prediction

Education

2021-Present   **PhD Student in CS**
Virginia Tech, Blacksburg, VA

2016-2020   **B.S. in Computer Engineering**
Auburn University, Auburn, AL

Teaching

2021-2022   **GTA for Computer Systems (CS3214)**, VT, Blacksburg, VA
Held office hours to assist undgraduate students in various projects
Managed bookkeeping for the course (Git contributions, late days, HW solutions)
20 hrs/week, 400 students total

2019-2020   **Engineering Tutor**, Auburn University, Auburn, AL
Tutored various course material (Calculus, Java, Physics, Digital Electronics)
12 hrs/week, 4-5 students/session

References

Available upon request