JACOB STERN CV

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EDUCATION

Brigham Young University 2020-2024
Ph.D. Computer Science
GPA: 3.98

Brigham Young University 2016-2020
B.S. Applied and Computational Mathematics
GPA: 4.0

PUBLICATIONS

MILCDock: Machine Learning-Enhanced Consensus Docking for Virtual Screening in Drug Discovery 2022

Stern, J. A.*, Morris, C. J.*, Stark, B., Christopherson, M., Della Corte, D. (2022). MILCDock: Machine Learning Enhanced Consensus Docking for Virtual Screening in Drug Discovery. Journal of Chemical Information and Modeling. doi:10.1021/acs.jcim.2c00705

Evaluation of Deep Neural Network ProSPr for Accurate Protein Distance Predictions on CASP14 Targets 2021

Stern, J. A.*, Hedelius, B.*, Fisher, O., Billings W.M., Della Corte, D. (2021). Evaluation of Deep Neural Network ProSPr for Accurate Protein Distance Predictions on CASP14 Targets. International Journal of Molecular Sciences. doi:10.3390/ijms222312835.

* - equal contribution

CURRENT RESEARCH

· **BayesDesign: A probabilistic formulation of protein design problems** 2022

Developed an transformer-based generative model to design proteins with high conformational specificity, applicable to mitigating protein misfolding in neurodegenerative diseases.

Using machine learning and molecular dynamics as complementary tools for virtual screening in CACHE 2022

Combined MILCDock with molecular dynamics and computational free energy calculations to form a complete computational virtual screening pipeline. Applied pipeline to the LRRK2 protein associated with Parkinson's disease and submitted predicted drug leads for the CACHE challenge.

WORK EXPERIENCE

Enveda Biosciences 2021
Deep Learning Consultant

Designed and built Siamese Transformer architecture for mass spectrum similarity prediction. Adapted base Roberta architecture for challenges specific to mass spectrometry data.

Nvidia 2020
Deep Learning Architecture Intern

Wrote software for kernel-by-kernel performance analysis of deep learning workloads on Nvidia GPUs. Enabled performance gains on the MLPerf benchmark by adding support for MXNet implementations of Single-Shot Detection and Resnet.

CaptionCall 2018
Speech Recognition/Machine Learning Intern

Benchmarked speech recognition providers by programming clients for speech recognition APIs. Wrote clients to stream audio data in real time for via asynchronous programming in C#.

TEACHING

Deep Learning - CS 474 2022
Instructor

Instructor for advanced undergraduate deep learning course covering automatic differentiation, optimization, regularization, CNNs, RNNs, transformers, generative models (GANs, VAEs, Flows, Diffusion), reinforcement learning, etc. with enrollment of 120 students.

REFERENCES

Dennis Della Corte dennis.dellacorte@byu.edu
Co-research advisor

David Wingate wingated@cs.byu.edu
Co-research advisor