Samuel Sledzieski

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EDUCATION

Massachusetts Institute of Technology — **Cambridge, MA**

PhD, Electrical Engineering and Computer Science — 2019 – 2024
- In Progress
- Concentration: Protein language models, protein and drug interactions, protein structure
- Advisor: Dr. Bonnie Berger

SM, Electrical Engineering and Computer Science — 2019 – 2021

University of Connecticut — **Storrs, CT**

BS, Computer Science — 2015 – 2019
- Minor in Molecular and Cellular Biology
- Concentration: Bioinformatics, Data Science
- Advisor: Dr. Mukul Bansal
- Magna Cum Laude, Honors Scholar

RESEARCH

Massachusetts Institute of Technology — **Cambridge, MA**

Research Assistant, Computation and Biology Group — Feb 2020 – Present

Serinus Biosciences — **Cambridge, MA**

Consultant — Feb 2023 – Present

Microsoft Research — **Redmond, WA**

Research Intern, AI For Good Lab — May 2023 – Oct 2023

Cellarity — **Cambridge, MA**

Machine Learning Intern, Perturbation Biology Group — May 2021 – Aug 2021

MIT Lincoln Laboratory — **Lexington, MA**

Summer Research Program, Advanced Lasercom Systems Group — May 2019 – Aug 2019

University of Connecticut — **Storrs, CT**

Undergraduate Research Assistant, Computational Biology Lab — Jan 2017 – May 2019

Software Developer, Jackson Laboratory for Genomic Medicine — Aug 2018 – May 2019

Undergraduate Research Assistant, Nelson Lab — Oct 2015 – Dec 2016

TEACHING

Massachusetts Institute of Technology — **Cambridge, MA**

Teaching Assistant, Machine Learning in Genomics (6.878) — Fall 2021

Teaching Assistant, Intro to Deep Learning (6.S191) — Winter 2021, 2022, 2023

University of Connecticut — **Storrs, CT**

Teaching Assistant, Theory of Computation — Spring 2018

JOURNAL PUBLICATIONS

[6] **Sledzieski***, Devkota*, Singh, Cowen, Berger, “TT3D: Leveraging Pre-Computed Protein Sequence Models to Predict Protein-Protein Interactions”, Bioinformatics, 2023; btad663

[5] **Sledzieski***, Singh*, Bryson, Cowen, Berger, “Contrastive learning in protein language space predicts interactions between drugs and protein targets”, Proceedings of the National Academy of Sciences 120.24 (2023): e2220778120.

[4] Kumar, Brenner, **Sledzieski**, Olaosebikan, Lynn-Goin, Putnam, Yang, Lewinski, Singh, Daniels, Cowen, Klein-Seetharaman, “Transfer of knowledge from model organisms to evolutionarily distant non-model organisms: The coral Pocillopora damicornis membrane signaling receptome,” Plos one 18.2 (2023). 10.1371/journal.pone.0270965

[3] Zaman*, **Sledzieski***, Wu, Bansal, "virDTL: Viral recombination analysis through phylogenetic reconciliation and its application to sarbecoviruses and SARS-CoV-2." Journal of Computational Biology 30.1 (2023): 3-20.

[2] Singh*, Devkota*, **Sledzieski**, Berger, Cowen, "Topsy-Turvy: integrating a global view into sequence-based PPI prediction," Bioinformatics, 38.Supplement 1 (July 2022): i264–i272.

[1] **Sledzieski***, Singh*, Cowen, Berger, "D-SCRIPT translates genome to phenome with sequence-based, structure-aware, genome-scale predictions of protein-protein interactions," *Cell Systems* 12.10 (2021): 969-982.

CONFERENCE AND WORKSHOPS

[5] **Sledzieski***, Kshirsagar, Baek, Berger, Dodhia, Lavista Ferres, "Parameter-Efficient Fine Tuning of Protein Language Models Improves Prediction of Protein-Protein Interactions" "Contrasting drugs from decoys" NeurIPS Workshop on Machine Learning for Structural Biology (MLSB) 2023.

[4] **Sledzieski***, Singh*, Cowen, Berger, "Contrasting drugs from decoys" NeurIPS Workshop on Machine Learning for Structural Biology (MLSB) 2022.

[3] **Sledzieski***, Singh*, Cowen, Berger, "Adapting protein language models for rapid DTI prediction" NeurIPS Workshop on Machine Learning for Structural Biology (MLSB) 2021.

[2] **Sledzieski***, Singh*, Cowen, Berger, "Sequence-based prediction of protein-protein interactions: a structure-aware interpretable deep learning model," *Conference on Research in Computational Molecular Biology* (RECOMB) 2021.

[1] **Sledzieski**, Zhang, Mandoiu, Bansal, "TreeFix-TP: Phylogenetic Error Correction for Accurate Reconstruction of Viral Transmission Networks," *Pacific Symposium on Biocomputing* (PSB) 2021: Proceedings, pages 119-130.

PREPRINTS

[2] **Sledzieski**, Kshirsagar, Baek, Berger, Dodhia, Lavista Ferres, "Democratizing Protein Language Models with Parameter-Efficient Fine-Tuning" *Under review*. *Conference on Research in Computational Molecular Biology* (RECOMB)

[1] Kousi, Boix, Park, Mathys, **Sledzieski**, Peng, Bennett, Tsai, Kellis, "Single-cell mosaicism analysis reveals cell-type-specific somatic mutational burden in Alzheimer's Dementia," *bioRxiv*. posted 22 April 2022, 10.1101/2022.04.21.489103

PRESENTATIONS

Intelligent Systems for Molecular Biology (ISMB)	Jul 2022, Jul 2023
Cold Spring Harbor Laboratory Meeting on Network Biology	Mar 2021, Mar 2023
Machine Learning in Structural Biology (MLSB) Workshop at NeurIPS	Dec 2021, Dec 2022
Research on Computational Molecular Biology (RECOMB)	Apr 2019, May 2022
Pacific Symposium on Biocomputing (PSB)	Jan 2021
IEEE ICCABS Workshop on Computational Advances for Next Generation Sequencing	Oct 2018
UConn Fall Frontiers in Undergraduate Research	Oct 2018
University of Connecticut Bioinformatics Seminar	Mar 2018, Oct 2018

AWARDS & FELLOWSHIPS

National Science Foundation (NSF) Graduate Research Fellowship	2021 - 2024
First Place, MIT Intro to Deep Learning Final Project Competition	2020
New England Scholar, University of Connecticut	2017 – 2019
Dean's List, College of Liberal Arts and Sciences, School of Engineering	2015 – 2019
Academic Excellence Scholarship, University of Connecticut	2015 – 2019
National Merit Scholarship Finalist	2014

SOFTWARE

D-SCRIPT https://github.com/samsledje/D-SCRIPT

34k+ PyPI downloads

ConPLex https://github.com/samsledje/ConPLex

5k+ PyPI downloads

	virDTL	https://github.com/suz11001/virDTL
	TreeFix-TP	https://github.com/samsledje/TreeFix-TP

MENTORING	MIT Research Summer Institute (RSI) Advisor	2022 – 2023
	MIT Undergraduate Research Opportunities Program (UROP) Advisor	2021 – 2023
	HackMIT Mentor	2019 – 2022

PEER REVIEW *Bioinformatics, Journal of Computational Biology, Nature, NeurIPS, Machine Learning in Structural Biology (MLSB), RECOMB*

MEMBERSHIPS & ACTIVITIES

International Society for Computational Biology (ISCB)
Institute of Electronics Engineers (IEEE)
Association for Computing Machinery (ACM)
Tau Beta Pi, Engineering Honor Society (TBΠ)
Eta Kappa Nu (IEEE-HKN)
Upsilon Pi Epsilon, Computer Science Honor Society (UPE)

[*CV compiled on 2023-12-08*]