

Daniel J. Saunders

M.Sc. Student
BINDS Lab
University of Massachusetts, Amherst
College of Information and Computer Sciences
Amherst, MA

djsaunde@cs.umass.edu
<https://djsaunde.github.io>
<https://github.com/djsaunde>
<https://medium.com/@danjsaund/>

Education

M.Sc. Computer Science, University of Massachusetts, Amherst Concentration: machine learning, computational neuroscience GPA: 3.7	2017– (Expected 12/2018)
B.S. Computer Science, University of Massachusetts, Amherst Concentration: theoretical computer science, artificial intelligence GPA: 3.5	2012–2016
B.S. Mathematics, University of Massachusetts, Amherst Concentration: mathematical computing GPA: 3.5	2012–2016

Employment

Graduate Research Assistant <i>Biologically Inspired Neural and Dynamical Systems Lab</i> Supervisor(s): Professors Robert Kozma and Hava Siegelmann	Spring 2017–Fall 2018
Data Science Intern <i>HealthcareSource</i> Supervisor(s): Patrick McDonough	Summer 2018
Programmer <i>Department of Resource Economics, University of Massachusetts, Amherst</i> Supervisor(s): Professors Christian Rojas and Debi Mohapatra	Fall 2016–Fall 2018
Research Intern <i>Air Force Research Lab Automatic Target Recognition Center</i> Supervisor(s): Dr. Roman Ilin and Professor Robert Kozma	Summer 2017
Programmer <i>Biologically Inspired Neural and Dynamical Systems Lab</i> Supervisor(s): Dr. Hava Siegelmann	Summer 2016
Programmer <i>Cognition and Action Lab, University of Massachusetts, Amherst</i> Supervisor(s): Professor Rebecca Spencer	Summer 2015–Winter 2017

Software Development Intern

Summer 2015

Epsilon

Supervisor(s): Patrick McDonough

Awards

Bay State Master's Program (50% of tuition & fees)

Spring 2017- Fall 2018

Graduate Research Fellowship

Spring 2017–Fall 2018

IJCNN 2018 - Runner-Up for Best Paper Award

Spring 2018

Unsupervised Learning with Self-Organizing Spiking Neural Networks

Publications

JOURNAL ARTICLES

1. H. Hazan, D. J. Saunders, H. Khan, D. Patel, D. T. Sanghavi, H. T. Siegelmann, and R. Kozma. Bindsnet: A machine learning-oriented spiking neural networks library in python. *Frontiers in Neuroinformatics*, 12:89, 2018.

CONFERENCE ARTICLES

2. H. Hazan, D. J. Saunders, D. T. Sanghavi, H. T. Siegelmann, and R. Kozma. Unsupervised learning with self-organizing spiking neural networks. In *International Joint Conference on Neural Networks*, 2018.
3. D. J. Saunders, H. T. Siegelmann, R. Kozma, and M. Ruzinkó. Stdp learning of image patches with convolutional spiking neural networks. In *International Joint Conference on Neural Networks*, 2018.

WORKING PAPERS (WORKING TITLES)

4. H. Hazan, D. J. Saunders, D. T. Sanghavi, H. T. Siegelmann, and R. Kozma. Lattice map spiking neural networks for clustering and classifying image data. Submitted to *Annals of Mathematics and Artificial Intelligence*.
5. D. J. Saunders, H. Hazan, H. T. Siegelmann, and R. Kozma. Locally Connected Spiking Neural Networks for Unsupervised Feature Learning.
6. H. Hazan, D. Patel, D. J. Saunders, H. T. Siegelmann, and R. Kozma. Transferring reinforcement learning policies to spiking neural networks for Atari game-playing.

Talks & Presentations

POSTER PRESENTATIONS

1. D. J. Saunders, H. Hazan, H. Khan, H. T. Siegelmann, R. Kozma. BindsNET: An ML-oriented spiking networks library built with PyTorch. PyTorch Developers Conference 2018. San Francisco, California. October 2, 2018.

Software

1. BindsNET: A spiking neural networks simulation library built with PyTorch.
GitHub repo: <https://github.com/Hananel-Hazan/bindsnet>
Authors: **D. J. Saunders**, H. Hazan, and H. Khan.
2. NYC-TLC: A Python package for the downloading and manipulation of NYC taxi trip records using the Dask distributed computation library.
GitHub repo: <https://github.com/djsaunde/nyctlc>
Authors: **D. J. Saunders**

Technical Skills, etc.

- Programming languages (ordered by decreasing proficiency): Python, R, Java, C/C++, MATLAB, SQL, JavaScript, Haskell
- Machine learning frameworks (ordered by decreasing proficiency): PyTorch, Scikit-Learn, Keras, Tensorflow, Theano, MatConvNet
- Reading list: <https://djsaunde.github.io/read/read.pdf>
- Notes on lab work, books, and papers: <https://djsaunde.github.io/notes>

Relevant coursework

- Machine learning (undergraduate & graduate)
- Artificial intelligence (undergraduate & graduate)
- Deep neural networks
- Statistics I & II (undergraduate)
- Mathematical statistics I & II (graduate)
- Distributed & operating systems
- Causal inference
- Algorithms for data science
- Applied information theory
- Dynamical systems
- Computational complexity