

Aaron Sossin

Biomedical Informatics Masters

Stanford, CA

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aaronsoossin.github.io (website)

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Skills

Languages: Python (pandas, numpy, sklearn, keras, pytorch, tensorflow, sqlite, ...), R (tidyverse, dplyr, ggplot, ...), Java, C#, C, Matlab, Javascript, Protégé, Bash, Unity, Git, Français

Machine Learning: Hands-on experience developing deep learning pipelines using pytorch and keras from scratch. Experience with Big Data, CNNs, RNNs, Supervised/Unsupervised Learning, Transfer Learning, Decoders, Classically Successful Architectures, Evaluation Metrics, Loss functions, Training Strategies, Hyper-parameter tuning, binary/multicategory/regression problems, etc.

Data Science: Principal Component Analysis, Uniform Manifold Approximation & Projection, Clustering, Advanced Plotting, Causal Inference, ANOVA, Regression Analyses, Bayesian Probability

Experience

SNC Lavalin / Deep Learning Consultant

Spring 2021 – December 2021, Stanford, CA

Consulting on machine learning projects focused on detecting corrosion in nuclear waste containers ([Python/Java](#))

Stanford University / Research

Winter 2021 - Present, Stanford, CA

Using state-of-the art deep learning to generate and segment parametric maps from MRP scans in Ischemic Stroke Patients ([Python/Matlab](#)).

* Patent Submitted⁷

Stanford University / Research Assistant

September 2020 - Present, Stanford, CA

Various projects focused on analyzing genome-wide sequencing data, create predictive genetic models, with a focus on Alzheimer's ([Python/R](#))

* First and secondary author publications at NAR and AJHG respectively^{5,6}

McGill University / Research Assistant

May 2019 - December 2019, Montreal, QC

Creating a 3D Genome Viewer in Virtual Reality (VR) by modelling genomic information using [Unity and C#](#). <https://www.biorxiv.org/content/10.1101/855379v1>

*Co-author of publication submitted the Journal of Bioinformatics²

Douglas Mental Health University Institute / Research Assistant

November 2017 - April 2019, Montreal, QC

Using *in vivo* techniques with neural data analysis to better understand how neuronal circuits in the hippocampus encode contextual memories and their causal role in fear discrimination ([Matlab, Python, Bonsai](#))

*Co-author of SFN posters on remapping in the hippocampus^{3,4}

Concordia University / Research Assistant

May 2016 - September 2016, Montreal, QC

Investigation of chiral interactions between molecules of interest using HPLC, Mass Spectrometry, and ITC

*Co-author of publication in the Journal of Chemical Communications¹

McGill University / Teaching Assistant

August 2019 - April 2019, Montreal, QC

Providing learning support for students, holding office hours, grading tests, and administrative work for COMP303 (Software Design). Class held in Java.

Education

Stanford University / Biomedical Informatics Masters

Fall 2020 - Present, Stanford, CA

McGill University / Major Neuroscience, Minor Computer Science

September 2017- 2020, Montreal, QC

3.95 GPA (on a 4.0 scale), Graduated in top 10%, Dean's Honor List

Publications/Patents

1) Nguyen, Thi Phuong Thao, et al. "Directing the Viedma ripening of ethylenediammonium sulfate using "Tailor-made" chiral additives." *Chemical Communications* 52.85 (2016): 12626-12629.

2) 3DGV: Simple Exploration of 3D Genome Structures using Virtual Reality. Éric Zhang 1,†, Chris Drogaris 1,†, Antoine Gédon 1, Aaron Sossin 1, Rajae Faraj 1, Yan Cyr 2, Jacek Majewski 3, Mathieu Blanchette 1, Jérôme Waldispühl 1 <http://csb.cs.mcgill.ca/3dgv/>

3) R. R. ROZESKE, L. RUNTZ, A. T. KEINATH, A. SOSSIN, M. P. BRANDON;

Psychiatry, McGill Univ., Montreal, QC, Canada. Examination of non-spatially tuned hippocampal neurons in a context fear discrimination task. Program No. 164.10. 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.

4) L. RUNTZ, R. R. ROZESKE, A. T. KEINATH, A. SOSSIN, M. P. BRANDON;

Dept. of Psychiatry, McGill Univ., Montreal, QC, Canada. Linking hippocampal remapping to memory retrieval in a context fear teleportation task. Program No. 164.11. 2019 Neuroscience Meeting Planner. Chicago, IL: Society for Neuroscience, 2019. Online.

5) Deep learning-assisted genome-wide characterization of massively parallel reporter assays. Fred Lu^{1,2}, Aaron Sossin³, Nathan Abell⁴, Stephen B. Montgomery^{4,5}, Zihui He^{6*} {Under Review}

6) Summary statistics knockoff inference empowers identification of putative causal variants in genome-wide association studies. Zihui He^{1,2*}, Linxi Liu³, Michael E. Belloy¹, Yann Le Guen^{1,4}, Aaron Sossin⁵, Xiaoxia Liu¹, Xinran Qi¹, Shiyang Ma⁶, Tony Wyss-Coray¹, Hua Tang⁷, Chiara Sabatti⁵, Emmanuel Candès^{8,9}, Michael D. Greicius¹, Iuliana Ionita-Laza⁶ {Under Review}

7) U.S. Provisional Patent Application No. 63/263,750. Filing Date: November 8, 2021; Methods and Systems of Generating; Perfusion Parametric Maps; Applicant: The Board of Trustees of the; Leland Stanford Junior University; First Named Inventor: Elizabeth Tong; Ref.: S31-07481.PRO;

Independent Projects

1) DepressionNet: Classifying Major Depression from Patient fMRIs using CNNs

(2021) - Aaron Sossin. https://github.com/aaronsossin/DepressionMRI_AI

2) The Effect of Cannabis on the Brain: A Machine Learning Approach to MRI Analysis

(2020) - Aaron Sossin, Vivian Zhu. <https://github.com/aaronsossin/Cannabis-MRI-Machine-Learning>

3) The Effects of Gradual Transitions Between Neutral and Dangerous Contexts on ventral CA1 Pyramidal Neurons in Mice (2019)

- Aaron Sossin, Léonie Runtz, Robert R. Rozeske and Mark P. Brandon. (see website for report)