

JOSEPH D VIVIANO

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EXPERIENCE

ML Scientist

2022–Now

[Yoshua Bengio's Group](#), [Mila Québec AI Institute](#)

- Lead developer of [TorchGFN](#), a modular and easy to extend open source GFlowNet library (an amortized sampling method used in many AI for science applications).
- Collaborations with [Amgen](#) (ML for antibody design) and [Intel](#) (large scale training of GFlowNets).
- Developed a collaboration and wrote a grant proposal with the [Joint BioEnergy Institute](#) to develop a multi-center AI for Metabolic Engineering research collaboration.
- ML engineering support for the lab, largely to optimize code-bases for efficient training (e.g., [RGFN](#) and [FLECS](#)).

ML Research Scientist

2021–22

[Deep Genomics](#)

- I investigated architectures for sequence-based RNA foundation models, methods for cell-type generalization (a core challenge for drug discovery), & anomaly detection pipeline for the drug screening platform allowing for early detection of laboratory failures.

Scientific Mentor

2021–Now

[Creative Destruction Lab Montréal](#)

- Performed technical assessment & consulting for early-stage startups.
- Guidance on ML and AI strategy towards next funding round.

Applied Research Scientist

2020–21

[Mila Technology Transfer](#), [Mila Québec AI Institute](#)

- Collaborative development of a deep-learning driven equity momentum trading strategy ([CDPQ](#)) & digital forgery detection ([Jumio](#)).
- Research on LLM data set composition & modular deep learning.

Fellow

2021

[PhD to VC, Fifty Years](#)

- I sourced and performed due-diligence on pre-seed/seed deep-tech companies, & helped source technical talent.

Research Intern

2020

[Google, Ad Predicted Click Through Rate Team](#)

- Uncertainty estimation research for predicted click through rates.

Research Intern

2019

[Imagia Cybernetics](#)

- Cancer localization methods (segmentation-free localization & weak supervision from clinical notes) addressing scarcity of labelled data.

Research Methods Specialist

2014–17

[Kimmel TIGRlab](#), [Centre for Addiction and Mental Health](#)

- Biomarkers for vulnerable [schizophrenia](#) and [Alzheimer's](#) patients.
- Designed, built, and managed (team of 5) a [data management platform](#) 22-node compute cluster, and [QA tools](#) used by team of 20.

PROJECTS

TorchGFN

259

stars, 49 forks, 13 contributors. A modular, easy to extend GFlowNet library. [arXiv](#).

TorchXRayVision

995 stars,

227 forks, 11 contributors. Open source library for XRay datasets & models. [PMLR 2022](#).

EDUCATION

MSc. CS, Machine Learning

2018–20

[Mila](#), Université de Montréal, Montréal, QC

Research on utility of saliency methods for [diagnosing generalization failures](#) of deep learning models.

MSc. Bio, Neuroscience, Cum Laude

2011–13

[Schneider Lab](#), York University, Toronto, ON

Subcortical fMRI methods ([1](#), [2](#)).

BSc. Psychology, Hons.

2005–09

Queen's University, Toronto, ON

INVITED TALKS

JGI Annual User Meeting

2023

Considerations for Machine Learning-Aided Lab in the Loop Scientific Discovery.

FACSS SciX Keynote Presentation

2024

Keynote presentation on AI for science.

RESEARCH & COMMUNITY

- **Teaching:** Stats & ML taught at [Center for Addiction and Mental Health](#) & [Montréal AI & Neuroscience Meeting](#), 2019.
- **Paper Reviews:** [NeurIPS](#), [ICLR](#), [Biological Psychiatry](#), [MIDL](#), & [PLOS ONE](#).
- **Area Chair:** [NeurIPS Datasets & Benchmark Track](#), 2023–2024.

PUBLICATIONS

* denotes first/last author.

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- Action abstractions for amortized sampling, [ICLR 2025](#).
- * What's in the Box? A Preliminary Analysis of Undesirable Content in the Common Crawl Corpus, [ACL 2021](#).
- * Saliency is a Possible Red Herring When Diagnosing Poor Generalization, [ICLR 2021](#).
- * Resting-state connectivity biomarkers of cognitive performance and social function in individuals with schizophrenia spectrum disorder and healthy control subjects, [Biological Psychiatry](#) 2018.