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 GFlowNet library.
- Collaborations with Amgen ↗ (GFlowNets for antibody design) and Intel ↗ (large scale training of GFlowNets), and general research support.

ML Research Scientist
2021–22
Deep Genomics ↗

- Self-supervised learning for biological sequence representations, multimodal methods facilitating biological sequence-to-sequence models to generalize to novel cell types, & anomaly detection pipeline for our drug screening platform.

Scientific Mentor
2021–Now
Creative Destruction Lab Montréal ↗

- Performed technical assessment of and consulting for startups, and provided feedback for a business and investor focused audience.

Applied Research Scientist
2020–21
Mila Technology Transfer, Mila Québec AI Institute ↗

- Deep-learning driven equity momentum trading (CDPQ ↗), robust representation learning for digital forgery detection (Jumio ↗), LLM dataset analysis, and modular deep learning.

Fellow
2021
PhD to VC, Fifty Years ↗

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

Research Intern
2020
Google, Smart Ad Relevance System Predicted Click Through Rate Team ↗

- Uncertainty estimation research for predicted click through rates.

Research Intern
2019
Imagia Cybernetics ↗

- Segmentation-free lesion localization and multimodal classification combining images with clinical notes.

Research Methods Specialist
2014–17
Kimel 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 ↗ — A modular, easy to extend GFlowNet library.

TorchXRayVision ↗ — Open source library for chest XRay datasets and models.

EDUCATION

MSc. Computer Science, Machine Learning Specialization
2018–20
Mila ↗ , Université de Montréal, Montréal, QC

- Research on whether saliency methods can be relied on to diagnose generalization failures ↗ of deep learning models.

MSc. Biology, Neuroscience Specialization, With Distinction
2011–13
Schneider Lab ↗ , York University, Toronto, ON

- Research using Magnetic Resonance Imaging of the human visual input ↗ and feedback ↗ systems.

BSc. Psychology, Hons.
2005–09
Queen's University, Toronto, ON

RESEARCH & COMMUNITY

Invited Talks: JGI Annual User Meeting, 2023 ↗ , FACSS SciX Keynote Presentation, 2024 ↗ . **Teaching**: Stats & ML taught at CAMH, McGill BrainHack ↗ , & MAIN ↗ . **Paper Reviews**: ICLR ↗ , NeurIPS Pre-registration in ML Workshop ↗ , Biological Psychiatry ↗ , MIDL ↗ , & PLOS ONE ↗ . **Area Chair**: NeurIPS Datasets & Benchmark Track ↗ .

Selected Publications h-index=20
denotes first/last author.

- Action abstractions for amortized sampling, 2024.
- torchgfn: A PyTorch GFlowNet library, 2023.
- TorchXRayVision: A library of chest X-ray datasets and models, 2022.
- * 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.

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