Vitória Barin Pacela

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Education

Ph.D., Computer Science – Université de Montréal, Mila 2021 – present

Supervisor: Prof. Simon Lacoste-Julien. Causal representation learning, disentanglement, interpretability.

M.Sc., Data Science – University of Helsinki 2019 – 2021

Thesis: *Independent Component Analysis for Binary Data*. Supervisor: Prof. Aapo Hyvärinen

B.Sc., Computer Science – University of Helsinki 2015 – 2019

Minors in Theoretical Physics and Mathematics/Statistics.

Experience

Cold Spring Harbor Laboratory Jun. 2025 – Sep. 2025

NeuroAI Summer Intern, New York, USA

Advised by Prof. David Klindt. Investigated out-of-distribution generalization in the overcomplete setting via sparse coding as an alternative to sparse autoencoders; mentored an undergraduate researcher. Manuscript in preparation.

Meta – Fundamental AI Research (FAIR) Oct. 2022 – Oct. 2024

Visiting Researcher, Montréal, Canada (part-time)

Wroked with Prof. Pascal Vincent on identifiability of quantized latent factors (CLeaR 2024) and a practical criterion for quantized disentanglement.

Earlier research experience: Mila (2019, streamflow forecasting under Prof. Yoshua Bengio); CERN Openlab (2018) and Caltech/CMS (2017), fast calorimeter simulation with GANs; Caltech (2016), photonic crystal characterization.

Selected Publications

- V. Barin-Pacela*, S. Joshi*, I. Camacho, S. Lacoste-Julien, D. Klindt. *Stop Probing, Start Coding: Why Linear Probes and Sparse Autoencoders Fail at Compositional Generalisation.* **UAI** 2026.
- V. Barin-Pacela, K. Ahuja, S. Lacoste-Julien, P. Vincent. *Operationalizing Quantized Disentanglement.* 2025.
- V. Barin-Pacela, K. Ahuja, S. Lacoste-Julien, P. Vincent. *On the Identifiability of Quantized Factors.* **CLeaR** 2024.
- A. Hyttinen, V. Barin-Pacela, A. Hyvärinen. *Binary Independent Component Analysis: A Non-stationarity-based Approach.* **UAI** 2022.
- D. Belayneh et al. (incl. V. Barin Pacela). *Calorimetry with Deep Learning: Particle Identification and Simulation for Collider Physics.* **European Physical Journal C**, 80(7), 2020.

Invited Talks

Bayes Plurinacional (2025); EIA University (2025); Bellairs Workshop on Causality (2025); Cold Spring Harbor Laboratory (2024); ISTA (2024); Mila GFlowNet Workshop (2023), Instituto de Matemática Pura e Aplicada (2023), FGV EMAp (2023).

Awards

Mila EDI Scholarship, Women in AI (2024–2027, $8,000/yr); Amii Upper Bound Talent Bursary (2025); Professor Cho Diversity Award, Mila (2021); Travel awards – ICML 2023, NeurIPS 2019, RIIAA LATAM 2024; Instituto TIM Selected Scholar (2015-2019, R$57,600.)

Teaching

Representation Learning (IFT6135, Mila/Université de Montréal) lectured by Professor Aaron Courville. 2025.

Leadership

Supervised one undergraduate student and one early-stage PhD student.
Meta Women in AI Steering Committee (2023/2024).

Selected Service

Reviewer – AISTATS 2024/2025, CLeaR 2025, UAI 2025. Teaching Skills Committee, University of Helsinki (2020). CERN International Masterclasses, invited speaker (2017-2026). Created the Mila Library (2022-2023).

Miscellanea

Hatha & Vinyasa Yoga Teacher Training (380h) w/ Sylvie Tremblay at Yoga Sangha, 2026.
Scientific Olympiads (2009–2014), 21 prizes in Brazilian nationals.
Languages: English, Portuguese, French.