

Vitória Barin Pacela

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Education

Université de Montréal, Mila 2021–present
Ph.D. Computer Science, DIRO
Supervisor: Professor [Simon Lacoste-Julien](#).

University of Helsinki 2019–2021
M.Sc. Data Science
Thesis: “Independent Component Analysis for Binary Data”.
Supervisors: Professor [Aapo Hyvärinen](#) and Dr. [Antti Hyttinen](#).

University of Helsinki 2015–2019
B.Sc. Computer Science
Minors in Theoretical Physics and Methodological Sciences (Mathematics and Statistics).
Thesis: “Energy Regression for Imaging Calorimetry with Deep Learning”.

Employment

Meta – Fundamental AI Research (FAIR) Oct. 2022–
Oct. 2024
Visiting Researcher, Montréal (CA), Part-time
Working with Professor [Pascal Vincent](#) on identifiable representation learning and out-of-distribution generalization. Collaborator: Dr. Kartik Ahuja. Project on the identifiability of quantized factors published at CLear 2024.

Publications

[V. Barin-Pacela](#), K. Ahuja, S. Lacoste-Julien, P. Vincent. On the Identifiability of Quantized Factors. 2024. **3rd Conference on Causal Learning and Reasoning (CLear)**. ([Paper](#))

A. Hyttinen, [V. Barin-Pacela](#), A. Hyvärinen. Binary Independent Component Analysis: A Non-stationarity-based Approach. **38th Conference on Uncertainty in Artificial Intelligence (UAI)**. 2022. ([Paper](#))

D. Belayneh, F. Carminati, A. Farbin, B. Hooberman, G. Khattak, M. Liu, J. Liu, D. Olivito, [V. Barin Pacela](#), M. Pierini, A. Schwing, M. Spiropulu, S. Vallecorsa, J-R. Vlimant, W. Wei, and M. Zhang. Calorimetry with Deep Learning: Particle Identification and Simulation for Collider Physics. **The European Physical Journal C**, 80 (7), 1-31, 2020. ([Paper](#))

Presentations

Introduction to Probability. [Mila GFLowNet Workshop](#). November 2023, Montreal, Canada. ([Video](#))

Análise de Componentes Independentes para Dados Binários. January 2023, Rio de Janeiro, Brazil.

- Instituto de Matemática Pura e Aplicada (IMPA), Seminário Centro Pi. ([Video](#))
- FGV EMap – Escola de Matemática Aplicada, Seminar.

Selected Awards

Mila EDI Scholarship	2024–2027
<i>Excellence Scholarship – Women in AI, \$8,000 per year.</i>	
Professor Cho Diversity Award	2021
<i>Selected scholar, Mila, \$1,500.</i>	
Instituto TIM Selected Scholar	2015–2019
<i>Scholarship for medalists of the Brazilian Mathematics Olympiad of Public Schools (OBMEP) enrolled in STEM undergraduate degrees, R\$57,600.</i>	
Scientific Olympiads	2009–2014
<i>Won 21 prizes in Brazilian scientific competitions during primary and secondary school, including a gold medal at OBMEP. Participated in six summer schools in physics and mathematics.</i>	

Selected Service

Conference Reviewer	2023
<i>International Conference on Artificial Intelligence and Statistics (AISTATS)</i>	
Meta Women in AI Steering Committee	2023–2024
<i>Montreal Lead</i>	
Reviewer, Mila PhD/MSc applications	2023
Mental Health First Aider – Mila	2023
<i>Certified training by the Mental Health Commission of Canada</i>	
Mila Library	2022–2023
<i>Created and managed a library of books at Mila.</i>	
Workshop Reviewer	
<i>SCIS at ICML 2023, SPIGM at ICML 2023, CRL at UAI 2022, WiML at NeurIPS 2019, LXAI at NeurIPS 2019.</i>	
Mila Mental Health Committee	2023
<i>Board member</i>	
Women in Machine Learning (WiML) Breakout Session	2023
<i>Leveraging Large Scale Models for Identifying and Fixing Deep Neural Networks Biases</i>	
<i>Co-organized with Polina Kirichenko, Reyhane Askari, Megan Richards, and Mohammad Pezeshki.</i>	
Volunteer	2023
<i>WiML, LXAI Workshops at ICML</i>	
Teaching Skills Committee	2020
<i>University of Helsinki, Department of Computer Science</i>	

Student member, **assessed teaching demonstrations and teaching merits** of candidates to the positions of **professor** and docent.

International Masterclasses 2017–2024

Invited panelist, Hands on Particle Physics at IFT & NCC – UNESP, São Paulo

Participated in round tables in the international day of women and girls in science, as well as in the general masterclasses.

Research internships

University of Helsinki 2020–2021

Research Assistant, Computer Science Department, Helsinki (FI)

Worked with Professor Aapo Hyvärinen and Dr. Antti Hyttinen on Independent Component Analysis for binary observations employing identifiable variational autoencoders [UAI 2022].

Mila – Quebec Artificial Intelligence Institute 2019

Summer Research Intern, Université de Montréal, Montreal (CA), Full-time

Worked under Professor Yoshua Bengio in the project Visualizing the Impact of Climate Change, predicting the streamflow of rivers for flood forecasting.

Helsinki Institute of Physics 2017–2018

Undergraduate Research Assistant, University of Helsinki, Helsinki (FI), Part-time

Worked in Professor Mikko Voutilainen’s group, a member of the Compact Muon Solenoid (CMS) collaboration, on jet energy reconstruction and fast calorimeter simulation with Generative Adversarial Networks (GANs).

CERN Openlab (Report) (Talk) 2018

Summer Student Intern, CERN, Geneva (CH), Full-time

Worked with Dr. Maurizio Pierini on fast calorimeter simulation using GANs, at the CMS experiment.

Caltech Group at LHC’s CMS Experiment 2017

Summer Undergraduate Research Fellow, Geneva (CH), Full-time

Worked under Professor Maria Spiropulu, Dr. Maurizio Pierini, and Dr. Jean-Roch Vlimant employing deep convolutional neural networks to estimate the energy of particles in the Linear Collider Detector calorimeter [EPJC 20].

Accelerator Laboratory 2016–2017

Undergraduate Research Assistant, University of Helsinki, Helsinki (FI), Part-time

Worked under Professor Kai Nordlund analyzing mechanical properties of nanowires through molecular dynamics simulations.

California Institute of Technology (Caltech) 2016

Summer Undergraduate Research Fellow, Pasadena (USA), Full-time

Worked under Professor Harry Atwater on the mid-infrared band structure characterization of double-gyroid photonic crystals.

Extended abstracts/Posters

V. Barin Pacela, K. Ahuja, S. Lacoste-Julien, P. Vincent. On the Identifiability of Quantized Factors. *RIIAA LATAM 2024*, Quito, Ecuador. (Travel award)

V. Barin Pacela, K. Ahuja, S. Lacoste-Julien, P. Vincent. Identifiability of Discretized Latent

Coordinate Systems via Density Landmarks Detection. *SCIS, SPIGM, and LXAI workshops at ICML 2023*, Honolulu, Hawaii, USA. (Travel award)

V. Barin Pacela, Antti Hyttinen, Aapo Hyvärinen. Independent Component Analysis for Binary Data with Variational Autoencoders. *CIFAR DLRL Summer School 2021*, Canada.

V. Barin Pacela, M. Pierini. Fast Calorimeter Simulation with Wasserstein Generative Adversarial Networks. *LXAI and WiML workshops at NeurIPS 2019*, Vancouver, Canada. (Travel award)

B. Hooberman, M. Zhang, W. Wei, V. Barin Pacela, G. Khattak, S. Vallecorsa, A. Farbin, J-R. Vlimant, F. Carminati, M. Spiropulu, M. Pierini. Calorimetry with Deep Learning: Particle Classification, Energy Regression, and Simulation for High-Energy Physics. *DLPS Workshop at NIPS 2017*, Long Beach, California, USA. ([Paper](#))

Languages

Portuguese (native), English (fluent), French (advanced), Finnish (elementary)