# João Monteiro

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**EXPERIENCE**  **Research**

*ServiceNow Research,*  December 2021 - Present
Sr. Research Scientist
London, UK
Role details:
- Conduct fundamental research with a focus on OOD and adversarial robustness.
- Conduct applied research on NLP. Train large-scale models on distributed settings.
- Collaborate with product teams to facilitate deployment of research results.
- Advise students/interns and establish academic collaborations.
- Design and conduct technical interviews.

*Borealis AI,*  May 2021 - October 2021
Research intern
Montreal, Canada
Role details:
- Conducted research on monotonic model classes for tabular data.
- Helped deploy and open sourcing the approaches we developed.
- Extended initial approaches to applications with non-tabular data.

*Google,*  September 2020 - April 2021
Student researcher
Montreal, Canada
Role details:
- Led a research effort on out-of-distribution robustness.
- Introduced domain-conditional predictors, able to adapt to varying properties of input data sources.

*Huawei Noah's Ark Lab - Montreal,*  July 2019 - February 2020
Research intern
Montreal, Canada
Role details:
- Worked on speaker-dependent speech recognition to define adaptive transcription systems able to handle voice/accent variations.
- Collaborated on an on-device speech recognition project and introduced training-time quantization approaches for transformers.

**RESEARCH INTERESTS**  Robustness against natural and adversarial data perturbations, explainable model classes, data-efficient learning, and trustworthy/controllable generative modeling.

**EDUCATION**  *Institut National de la Recherche Scientifique*  January 2017 - November 2021
Ph.D.
Montreal, Canada

*University of Pernambuco*  
Master of Science in Computer Engineering  
Recife, Brazil

August 2015 - December 2016

*University of Pernambuco*  
Bachelor in Mechanical Engineering  
Recife, Brazil

August 2007 - June 2012

**SELECTED PUBLICATIONS**

- C. Tsirigotis, **J. Monteiro**, P. Rodríguez, D. Vázquez, A. Courville "Group Robust Classification Without Any Group Information", NeurIPS, 2023.
- C. Guilles-Escuret, P. Rodríguez, D. Vázquez, I. Mitliagkas, **J. Monteiro** "CADet: Fully Self-Supervised Out-Of-Distribution Detection With Contrastive Learning", NeurIPS, 2023. arXiv:2210.01742
- **J. Monteiro**, P. Rodríguez, P. A. Noël, I. Laradji, D. Vázquez "Constraining Representations Yields Models That Know What They Don't Know", International Conference on Learning Representations (ICLR), 2023. arXiv:2208.14488
- **J. Monteiro**, T. Scholak, V. Mehta, D. Vázquez, C. Pal "Multilingual Code Retrieval Without Paired Data: A New Benchmark and Experiments", Deep Learning for Code Workshop at ICLR, 2023.
- "StarCoder: may the source be with you!", Pre-print, 2023. arXiv:2305.06161. *Lengthy author list omitted.*
- **J. Monteiro**, M. O. Ahmed, H. Hajimirsadeghi, G. Mori "Monotonicity Regularization: Improved Penalties and Novel Applications to Disentangled Representation Learning and Robust Classification", The Conference on Uncertainty in Artificial Intelligence (UAI), 2022.
- I. Albuquerque, **J. Monteiro**, O. Rosanne, T. Falk "Estimating Distribution Shifts for Predicting Cross-Subject Generalization in Electroencephalography-based Mental Workload Assessment", Frontiers in Artificial Intelligence, 2022.
- **J. Monteiro**, M. O. Ahmed, H. Hajimirsadeghi, G. Mori "Not Too Close and Not Too Far: Enforcing Monotonicity Requires Penalizing The Right Points", eXplainable AI approaches for debugging and diagnosis at NeurIPS, 2021.
- **J. Monteiro**\*, X. Liu\*, I. Albuquerque, Y.Lai, C. Jiang, S. Zhang, T. Falk, J. Liang. "Single-shot real-time compressed ultrahigh-speed imaging enabled by a snapshot-to-video autoencoder", Photonics Research, 2021. \**Equal contribution*
- **J. Monteiro**, X. Gibert, J. Feng, V. Dumoulin, D.S. Lee "Domain Conditional Predictors for Domain Adaptation", Pre-registration workshop at NeurIPS, 2020.
- **J. Monteiro**, I. Albuquerque, J. Alam, R. D. Hjelm, T. Falk "An end-to-end approach for the verification problem: learning the right distance", 37th International Conference on Machine Learning (ICML), 2020. arXiv:2002.09469
- I. Albuquerque, **J. Monteiro**, M. Darvishi, T. Falk, I. Mitliagkas "Generalizing to unseen domains via distribution matching", Uncertainty and Robustness in Deep Learning Workshop at ICML, 2020. arXiv:1911.00804
- M. Ravanelli, J. Zhong, S. Pascual, P. Swietojanski, **J. Monteiro**, J. Trmal, Y. Bengio, "Multi-task self-supervised learning for Robust Speech Recognition", 45th International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2020. arXiv:2001.09239
- **J. Monteiro**\*, I. Albuquerque\*, T. Doan, B. Considine, T. Falk, I. Mitliagkas, "Multi-objective training of Generative Adversarial Networks with multiple discriminators", 36th International Conference on Machine Learning (ICML), 2019. arxiv:1901.08680 \**Equal contribution*

- T. Doan, **J. Monteiro**, I. Albuquerque, B. Mazoure, A. Durand, J. Pineau, R. D. Hjelm. "Online Adaptative Curriculum Learning for GANs", The 33rd AAAI Conference on Artificial Intelligence, 2019. arXiv:1808.00020

**ENGINEERING SKILLS**

- Extensive experience with Pytorch and some experience with Tensorflow.
- Comfortable with training very large models in distributed settings. Recent examples of large-scale projects I took part in are as follows:
  - Recently led initiatives to train a T5 with approximately 6 billion parameters on code and text data from GitHub using NVIDIA's Megatron. The model was trained on 400 billion tokens using 96 GPUs distributed across 12 nodes.
  - Led a task force within the BigCode project to train BERT-like models on code and text. The resulting codebase is hosted here: `https://github.com/bigcode-project/bigcode-encoder`, and our first released model can be found here: `https://huggingface.co/bigcode/starencoder`. The resulting model was used by another team within BigCode to remove private identifiable information from data prior to training language models such as StarCoder.
- Recently performed crawling of GitHub source code files followed by AST parsing and language identification to build a multi-lingual text-to-code benchmark, described in this paper: `https://dl4c.github.io/assets/pdf/papers/12.pdf`

**OTHER**

- *Academic service*: Area achair for ICLR 2024. Regularly reviewing for flagship Machine Learning conferences since 2020.
- *Invited talks*: Closing the gap between machine learning research and practice via versatile and robust predictors (ServiceNow - July 2021), The verification problem and its applications to voice biometrics (Huawei Noah's Ark lab - November 2019).
- *Able to communicate in the following languages*: Portuguese (native), English (fluent), Italian (advanced), French (beginner)