Rodrigo Veiga

Postdoctoral researcher

École Polytechnique Fédérale de Lausanne (EPFL)
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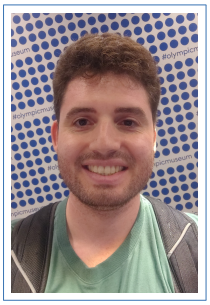

Education

2017–2022 : **Doctor of Science, Physics**, *University of São Paulo*, São Paulo, Brazil.
Thesis: *Statistical Physics Analysis of Machine Learning Models*

2010–2012 : **Master of Science, Physics**, *University of São Paulo*, São Carlos, Brazil.
Thesis: *Effects of Correlated Hybridization in the Single-impurity Anderson Model* (in portuguese)

2006–2009 : **Bachelor of Science, Physics**, *University of São Paulo*, São Carlos, Brazil.

Publications

Articles

2024 **R. Veiga**, A. Remizova, and N. Macris. Stochastic gradient flow dynamics of test risk and its exact solution for weak features, *arxiv:2402.07626*, 2024.

2023 **R. Veiga**, L. Stephan, B. Loureiro, F. Krzakala, and L. Zdeborová. Phase diagram of stochastic gradient descent in high-dimensional two-layer neural networks*. *Journal of Statistical Mechanics: Theory and Experiment*, volume 2023, page 114008. IOP Publishing, *Updated version of the proceeding published in Advances in Neural Information Processing Systems 35 (NeurIPS 2022), nov 2023.

2023 E. Cornacchia*, F. Mignacco*, **R. Veiga***, C. Gerbelot, B. Loureiro, and L. Zdeborová. Learning curves for the multi-class teacher–student perceptron. *Machine Learning: Science and Technology*, volume 4, page 015019. IOP Publishing, *Equal contribution, 2023.

2020 **R. Veiga** and R. Vicente. Restricted Boltzmann machine flows and the critical temperature of Ising models, *arxiv:2006.10176*, 2020.

2020 **R. Veiga**, R. Murta, and R. Vicente. Age-structured estimation of COVID-19 ICU demand from low quality data, *arxiv:2006.06530*, 2020.

Conference Proceedings

2022 **R. Veiga**, L. Stephan, B. Loureiro, F. Krzakala, and L. Zdeborová. Phase diagram of stochastic gradient descent in high-dimensional two-layer neural networks. In *Advances in Neural Information Processing Systems NeurIPS*, volume 35, pages 23244–23255, 2022.

2013 V. Líbero and **R. Veiga**. Effects of correlated hybridization in the single-impurity Anderson model. In *APS March Meeting Abstracts*, volume 2013 of *APS Meeting Abstracts*, page R19.004, March 2013.

Research Experience

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Oct 2022–present ***Postdoctoral researcher***.
SMILS - Lab for Statistical Mechanics of Inference in Large Systems
Supervisor: Prof. Nicolas Macris

Feb 2021–Jan 2022 ***Vising doctoral student***.
IdePHICS - Information, Learning and Physics Lab
Supervisor: Prof. Florent Krzakala

University of São Paulo (USP), Brazil

Jul 2017–Aug 2022 ***Doctoral student***.
IFUSP - Physics Institute
Supervisor: Prof. Renato Vicente
Project: Statistical physics and machine learning models

Aug 2012–May 2013 ***Doctoral student***.
IFSC-USP São Carlos Physics Institute
Supervisor: Prof. Miled Moussa
Project: Entanglement and quantum discord in the superradiance and applications of quantum information theory in NMR

Mar 2010–May 2012 ***Master student***.
IFSC-USP São Carlos Physics Institute
Supervisor: Prof. Valter Líbero
Project: Effects of correlated hybridization in the single-impurity Anderson model

Apr 2008–Dec 2009 ***Undergraduate student project***.
IFSC-USP São Carlos Physics Institute
Supervisor: Prof. Valter Líbero
Project: Density functional theory applied to the antiferrimagnetic Heisenberg model

Computer skills </>

Programming Python, Cython, R, Fortran, Wolfram Mathematica
Machine learning PyTorch, Scikit-learn, Keras
OS Linux

Languages

English Fluent
French Basic
Portuguese Native

Participation in events

Apr 2024 From Theory to Practice: Workshop in Data Science; African Institute for Mathematical Sciences; Kigali, Rwanda.

Invited speaker: *Time Evolution of the Test Risk under Stochastic Gradient Flow Dynamics*.

Aug 2023 Statistical Physics and Machine Learning Back Together; Cargèse, France.

Poster presentation: *Phase diagram of stochastic gradient descent in high-dimensional two-layer neural networks*.

Jun 2023 Mathematical Physics of Complex Systems; Cortona, Italy.

Dec 2022 NeurIPS, Conference on Neural Information Processing Systems; New Orleans, USA.

Poster presentation: *Phase diagram of stochastic gradient descent in high-dimensional two-layer neural networks*.

Dec 2021 EPFL CIS NeurIPS Mirror Event, *EPFL*; Lausanne, Switzerland.

Aug 2021 Mathematical and Scientific Machine Learning (MSML). *EPFL*; Lausanne, Switzerland.

Dec 2019 First School on Data Science and Machine Learning, *ICTP-SAIFR*; São Paulo, Brazil.

Sep 2017 Minicourse on Machine Learning for Many-Body Physics, *ICTP-SAIFR*; São Paulo, Brazil.

Oct 2012 II SIFSC - São Carlos Physics Institute Graduate Workshop, *IFSC-USP*; São Carlos, Brazil.

Poster presentation: *Entanglement and quantum Discord in the superradiance*.

Jul 2011 Brazilian School on Statistical Mechanics, *IIP-UFRN*; Natal, Brazil.

Poster presentation: *Effects of correlated hybridization in the single-impurity Anderson model*.

Nov 2010 I SIFSC - São Carlos Physics Institute Graduate Workshop, *IFSC-USP*; São Carlos, Brazil.

Poster presentation: *Correlated hybridization in the single-impurity Anderson model and non-local functional in the Heisenberg model*.

References

Prof. Nicolas Macris
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Prof. Florent Krzakala
École Polytechnique Fédérale de Lausanne
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Prof. Renato Vicente
University of São Paulo
✉ rvicente@usp.br

Prof. Nestor Caticha
University of São Paulo
✉ ncaticha@usp.br

Non-academic work experience

Jul 2013– Mar 2017 ***Financial administrator***.
Primos Materiais para Construções Ltda, Brazil.