CONTACT INFORMATION

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PERSONAL DATA

Full Name: João Morais Carreira Pereira
Citizenship: Portugal

PRESENT OCCUPATION

Instituto de Matemática Pura e Aplicada (IMPA), Rio de Janeiro RJ, Brazil *from June 2022*
Assistant Professor

PAST OCCUPATION

University of Texas at Austin, Austin, TX, USA *January 2021 to May 2022*

Postdoctoral Associate in the Oden Institute for Computational Sciences

- Supervised by Joe Kileel and Rachel Ward

Duke University, Durham, NC, USA *June 2019 to December 2020*

Postdoctoral Associate in the Department of Electrical and Computer Engineering

- Supervised by Vahid Tarokh

EDUCATION

Princeton University, Princeton, NJ, USA

Ph.D. in Applied and Computational Mathematics *September 2014 to June 2019*

- Advised by Amit Singer and Emmanuel Abbe
- Thesis: Information theoretic aspect of cryo-electron microscopy

University of Coimbra, Coimbra, Portugal

M.S. in Mathematics *September 2012 to September 2014*

- GPA: 18.3/20

B.S. in Mathematics *September 2009 to July 2012*

- GPA: 18.3/20

PUBLICATIONS

16. L. D. Abreu and J. M. Pereira,
*Orthonormal functions with prescribed time-frequency localization,*
ResearchGate pre-print.

15. A. Hasan, K. Elkhalil, Y. Ng, J. M. Pereira, S. Farsiu, J. Blanchet, and V. Tarokh,
*Modeling extremes with d-max-decreasing neural networks,*
in Uncertainty in Artificial Intelligence. PMLR, 2022, pp. 759–768.

14. J. M. Pereira, J. Kileel, and T. G. Kolda,
*Tensor moments of Gaussian mixture models: theory and applications,*
ArXiv preprint, arXiv:2202.06930, 2022.

13. J. Kileel, T. Klock, and J. M. Pereira,
*Landscape analysis of an improved power method for tensor decomposition,*
in Advances on Neural Information Processing Systems (NeurIPS), 2021.

12. A. Hasan, K. Elkhalil, J. M. Pereira, S. Farsiu, J. H. Blanchet, and V. Tarokh,
*Deep extreme value copulas for estimation and sampling,*
ResearchGate pre-print, 2021.

11. A. Hasan, J. M. Pereira, S. Farsiu, and V. Tarokh,
*Identifying latent stochastic differential equations,*
IEEE Transactions on Signal Processing, vol. 70, pp. 89–104, 2021.

10. J. Kileel and J. M. Pereira,
*Subspace power method for symmetric tensor decomposition and generalized PCA,*
ArXiv preprint, arXiv:1912.04007, 2019.

9. A. Hasan, J. M. Pereira, R. Ravier, S. Farsiu, and V. Tarokh,
*Learning partial differential equations from data using neural networks,*
in ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020, pp. 3962–3966.

8. Y. Ng, J. M. Pereira, D. Garagic, and V. Tarokh,
*Robust marine buoy placement for ship detection using dropout k-means,*
in ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020, pp. 3757–3761.

7. E. Abbe, T. Bendory, W. Leeb, J. M. Pereira, N. Sharon, and A. Singer,
*Multireference alignment is easier with an aperiodic translation distribution,*
IEEE Transactions on Information Theory, vol. 65, no. 6, pp. 3565–3584, 2018.

6. E. Abbe, J. M. Pereira, and A. Singer,
*Estimation in the group action channel,*
in 2018 IEEE International Symposium on Information Theory (ISIT), June 2018, pp. 561–565.

5. E. Abbe, J. M. Pereira, and A. Singer,
*Sample complexity of the Boolean multireference alignment problem,*
in 2017 IEEE International Symposium on Information Theory (ISIT), June 2017, pp. 1316–1320.

4. L. D. Abreu, J. M. Pereira, and J. L. Romero,
*Sharp rates of convergence for accumulated spectrograms,*
Inverse Problems, vol. 33, no. 11, p. 115008, 2017.

3. L. D. Abreu, J. M. Pereira, J. L. Romero, and S. Torquato,
*The Weyl–Heisenberg ensemble: hyperuniformity and higher Landau levels,*
Journal of Statistical Mechanics: Theory and Experiment, no. 4, p. 043103, 2017.

2. L. D. Abreu and J. M. Pereira,
*Pseudo prolate spheroidal functions,*
in 2015 International Conference on Sampling Theory and Applications (SampTA), 2015, pp. 603–607.

1. L. D. Abreu and J. M. Pereira,
*Measures of localization and quantitative Nyquist densities,*
Applied and Computational Harmonic Analysis, vol. 38, no. 3, pp. 524–534, 2015.

## Conference Talks and Communications

34. Topical Workshop on Higher-Order Statistics and Symmetric Tensors (Organizer), Institute for Computational and Experimental Research in Mathematics, Brown University, USA, January 2024 (Upcoming)

33. Workshop on Optimization and Inverse Problems, UFSC, Brazil, October 2023

32. Conference on Personal Medicine, IMPA, Brazil, September 2023

31. Optimization Seminar, IMPA, Brazil, September 2023

30. Global Portuguese Mathematicians, Universidade de Coimbra, Portugal, June 2023

29. Seminário de Apresentação, IMPA, Brazil, March 2023

28. Seminário DMUC, Universidade de Coimbra, Portugal, December 2022

27. CAMGSD Seminar, Instituto Superior Técnico, Portugal, November 2022

26. CSP Seminar, University of Michigan, USA, October 2022

25. SIAM conference on Mathematics of Data Science (MDS), San Diego, USA, September 2022

24. Centro Pi seminar, IMPA, Brazil, September 2022
23. NUMA Seminar, KU Leuven (virtual), Belgium, April 2022
22. Mathematics of Data & Decisions Seminar, University of California at Davis (virtual), USA, April 2022
21. IMA Data Science Seminar, University of Minnesota, USA, April 2022
20. Oden Institute Seminar, University of Texas at Austin, March 2022
19. Machine Learning + X Seminar, Brown University (virtual), USA, December 2021
18. Conference on Neural Information Processing Systems, virtual, December 2021
17. MAD+ Seminar, ETH Zurich (virtual), Switzerland, November 2021.
16. Encontro Nacional da Sociedade Portuguesa de Matemática, Portugal (virtual), July 2021,
15. Youth in High Dimensions, Virtual, June 2021,
14. International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2020, Barcelona, Spain (Virtual), May 2020
13. Signal Processing/ECE Seminar, Duke University, December 2018
12. International Symposium in Information Theory (ISIT) 2018, Vail, Colorado, USA, June 2018
11. NMR Protein Determination: Theory and methods, Unicamp, Campinas, Brazil, May 2018
10. Conference on Information Sciences and Systems (CISS) 2018, Princeton University, March 2018
9. PACM Graduate Student Seminar, Princeton University, March 2018
8. PACM Graduate Student Seminar, Princeton University, February 2018
7. Mathematics, Information and Computation (MIC) Seminar, New York University, New York, USA, February 2018
6. PACM Graduate Student Seminar, Princeton University, October 2017
5. International Conference on Sampling Theory and Applications (SampTA) 2017, Tallinn, Estonia, July 2017
4. International Symposium in Information Theory (ISIT) 2017, Aachen, Germany, June 2017
3. PACM Graduate Student Seminar, Princeton University, February 2017
2. Strobl16, Time-Frequency Analysis and Related Topics, Strobl, Austria, June 2016
1. International Conference on Sampling Theory and Applications (SampTA) 2015, Washington D.C., USA, July 2015

## Teaching Experience

Instituto de Matemática Pura e Aplicada

- Linear Algebra and Applications, Instructor — *Spring 2023*

University of Texas at Austin

- Real analysis I, Consultant — *Spring 2021*

Duke University

- Multivariable Calculus for Economics, Instructor — *Fall 2020*

Princeton University

- Transmission and Compression of Information, Assistant in Instruction — *Spring 2017*
- Calculus I, Assistant in Instruction — *Fall 2015*

Instructor and Tutor at Projecto Delfos — *September 2009 to July 2014*

- Preparing the Portuguese team for the International Math Olympiads (IMO)
- Deputy Leader of the Portuguese IMO team in 2014

## Awards

Awarded two *Young Talents in Mathematics* fellowships: 2009/2010 and 2010/2011 by *Calouste Gulbenkian Foundation*.

University of Coimbra

- Merit awards for student with the best GPA: on 2011 and 2012
- Prize for the 3% best students, 2011 and 2012

Mathematical Olympiads

- International Mathematical Olympiads, Bronze Medal, 2009
- Ibero-American Math Olympiads for Undergraduates, Bronze Medal, 2009
- Portuguese Math Olympiads, Gold Medal, 2009 and Silver Medal, 2006
- Sao Paulo Math Olympiads (Portugal and Brazil), Gold Medal (2006) and Silver Medal (2008)
- Mayo Math Olympiads (Ibero-American), Silver Medal, 2006

Other Olympiads

- Portuguese Physics Olympiads, $4^{th}$ place, 2008
- Ibero-American Physics Olympiads, Silver Medal, 2009

## Advising

Arthur Bizzi, IMPA, Ph.D.

Gabriel Laurentino, IMPA, Masters

## Service

Co-organizing workshop "Connecting Higher-Order Statistics and Symmetric Tensors", Institute for Computational and Experimental Research in Mathematics, Brown University, January 2024

Referee for conference and journals, including: SIAM Journal on Mathematics of Data Science, IMA Journal of Inference and Applications, Conference on Learning Theory (COLT), IMS Statistical Sciences, Discrete & Computational Geometry, Springer Journal of Fourier Analysis and Applications, Journal of Machine Learning, IEEE Journal of Selected Topics in Signal Processing, Journal of Approximation Theory.

Treasurer for the Latino Graduate Student Association (LGSA), Princeton University, 2018

Organized the Graduate Student Seminar, Princeton University, 2016

Master's students representative for the administration organ of the Mathematics Department of the University of Coimbra (2012-2013)

Administration of the Mathematics Student Association (NEMAT/AAC), integrated in the Academic Association of Coimbra, Vice-President, 2012 and President, 2013.

## Programming Skills

Experience coding in MATLAB, Python, C/C++ and Mathematica.

Experience implementing and training neural networks (using PyTorch).

Experience in object oriented programming, parallel computing and visual computing.

## Other Experiences

Participant in the European Summer School in Industrial Mathematics and Modelling Week, 2013.

## Language Skills

Portuguese (Native Language), English (Fluent), Spanish and French (Some Reading, Listening and Talking)

English: Certified by TOEFL (2014) with the grade: 106/120