



Joao Pinheiro Neto, PhD

POSTDOCTORAL RESEARCHER · PHYSICIST

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Summary

Physicist with experience in modeling collective dynamics of complex systems. I specialize in data analysis of large datasets, with an emphasis on data quality and sampling effects. Currently working on how the structure of social media impacts opinion spreading in social networks.

Education & Academic Experience

Max Planck Institute for Dynamics and Self-Organization

Göttingen, Germany

POSTDOCTORAL RESEARCHER

Jan. 2021 -

- Physics of Social Systems Group, Department of Dynamics of Complex Fluids
- Funding: Max Planck Society

Georg August University of Göttingen

Göttingen, Germany

PHD IN PHYSICS

Nov. 2017 - Jan. 2021

- Title: *Criticality and sampling in neuronal networks* (supervisor: Dr. Viola Priesemann)
- Funding: Brazilian Council for Scientific and Technological Development & Max Planck Society
- Grade: Magna cum laude

State University of Campinas

Campinas, Brazil

MSc IN PHYSICS

Feb. 2012 - Dec. 2014

- Title: *A study on the dynamics of neural networks* (supervisor: Prof. Dr. José Antônio Brum)
- Funding: São Paulo Research Foundation

University of Bremen

Bremen, Germany

GUEST RESEARCHER

Nov. 2013 - Mar. 2014

- Guest at the Complex Systems Lab (supervisor: Prof. Dr. Stefan Bornholdt)
- Funding: São Paulo Research Foundation

State University of Campinas

Campinas, Brazil

BSc IN PHYSICS

Feb. 2008 - Dec. 2011

Coding Skills

Proficient Python, MATLAB, MongoDB, LaTeX, git

Basic R, Julia, C, bash, SQL

Professional Experience

Max Planck Institute for Dynamics and Self-Organization

Göttingen, Germany

POSTDOCTORAL RESEARCHER

Jan. 2021 -

- Modeling and data analysis of multiple social media platforms.
- Data scraping and data cleaning.
- Creation and maintenance of multi-billion-object MongoDB databases.
- Network and NLP analysis of social media data.

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PHD CANDIDATE

Feb. 2015 - Jan 2021

- Data analysis of large-scale experimental data in Neuroscience, using methods from Physics, Network Theory and Information Theory.
- Development of fast network dynamics simulations using CUDA and parallelization in MATLAB.
- Signal processing and filtering of timeseries.
- Supervision of 3 MSc students, and tutoring in several university block seminars.
- Modeling of COVID-19 spread using Bayesian statistics.

- Modelling of large-scale dynamical networks using methods from Network Theory (clustering, community detection, etc).
- HPC simulations of particle physics interactions and development of a software to interpolate simulation results.
- Teaching assistant for undergraduate classes. Disciplines: Experimental Physics I (2009, 2011), Probability I (2010)

Research Publications

6. **J. P. Neto**, F. P. Spitzner, and V. Priesemann. A unified picture of neuronal avalanches arises from the understanding of sampling effects. *bioRxiv*: 759613v2 (under review)
5. F. P. Spitzner, J. Dehning, J. Wilting, A. Hagemann, **J. P. Neto**, J. Zierenberg, and V. Priesemann (2021). Mr. estimator, a toolbox to determine intrinsic timescales from subsampled spiking activity. *PLOS ONE*, 16:e0249447
4. J. Dehning, J. Zierenberg, F. P. Spitzner, M. Wibral, **J. P. Neto**, M. Wilczek, and V. Priesemann (2020). Inferring change points in the spread of covid-19 reveals the effectiveness of interventions. *Science*, 369:eabb9789
3. J. Dehning, F. P. Spitzner, M. C. Linden, S. B. Mohr, **J. P. Neto**, J. Zierenberg, M. Wibral, M. Wilczek, and V. Priesemann (2020). Model-based and model-free characterization of epidemic outbreaks. *medRxiv*, page 2020.09.16.20187484
2. J. Wilting, J. Dehning, **J. P. Neto**, L. Rudelt, M. Wibral, J. Zierenberg, and V. Priesemann (2018). Operating in a reverberating regime enables rapid tuning of network states to task requirements. *Frontiers in Systems Neuroscience*, 12
1. **J. P. Neto**, de M. A. M. Aguiar, J. A. Brum, and S. Bornholdt (2017). Inhibition as a determinant of activity and criticality in dynamical networks. *arXiv*: 1712.08816