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

University of Konstanz — *Konstanz, Germany*

Postdoctoral Researcher — *Feb. 2021 -*

- Social Data Science Lab, Department of Politics and Public Administration
- Funding: University of Konstanz

Max Planck Institute for Dynamics and Self-Organization — *Göttingen, Germany*

Postdoctoral Researcher — *Jan. 2021 - Jan. 2023*

- 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

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, git

Basic R, Julia, C, bash, SQL

Professional Experience

Max Planck Institute for Dynamics and Self-Organization — *Göttingen, Germany*

Postdoctoral Researcher — *Jan. 2021 - Jan. 2023*

- 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.
- Supervision of 3 BSc students.

Max Planck Institute for Dynamics and Self-Organization *Göttingen, Germany*

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 inference.

State University of Campinas *Campinas, Brazil*

Student *Feb. 2008 - Dec. 2014*

- 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. **Neto, J. P.**, F. P. Spitzner, and V. Priesemann (2022). Sampling effects and measurement overlap can bias the inference of neuronal avalanches. *PLOS Computational Biology*, 18(11):1–22
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*