Helcio Felippe Junior

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Education

M.Sc. in Physics. Federal University of Rio Grande do Norte   2019–2021

> 📄 **Thesis**: *Pearson matrices as density operators: A test of the entropic brain hypothesis using the von Neumann entropy.*
> **Advisor**: Prof. Gandhimohan M. Viswanathan ⓘD
> **Co-adviso**r: Dr. Aline Viol ⓘD

B.Sc. in Physics. Federal University of Santa Catarina   2012–2018

Publications

Peer-reviewed

> 📄 A. Viol, **H. Felippe, Jr.**, F. Palhano-Fontes, H. Onias, D. B. de Araujo, and G. M. Viswanathan. "Statistical physics applied to the neuroscience of altered states: the brain under the influence of psychedelics". *Rev. Bras. Ens. Fís.* **43** (2021). doi: 10.1590/1806-9126-RBEF-2020-0440.

Preprint

> 📄 **H. Felippe**, A. Viol, D. B. de Araujo, M. G. E. da Luz, F. Palhano-Fontes, H. Onias, E. P. Raposo, and G. M. Viswanathan. "The von Neumann entropy for the Pearson correlation matrix: A test of the entropic brain hypothesis". arXiv:2106.05379.

Book chapter

> 📄 J. R. B. Arenhart and **H. Felippe, Jr.** "The Fate of Bundle and Substratum Theories Under KS Theorem" in *A True Polymath: A Tribute to Francisco Antonio Doria*, J. A. de Barros and D. Krause, Eds. (College Publications, 2020), pp. 1–22. ISBN: 978-1-84890-351-7.

Research experience

Graduate Research Assistant   2019–2021

Statistical physics applied to neuroscience: Developed a threshold-free approach to calculate the entropy of correlation matrices. Analyzed fMRI time series to test the entropic brain hypothesis for serotonergic agonist action.

Collaborator   2018–2020

Logical foundations of quantum theory: Worked with quasi-set theory (a ZFU-like set theory with weaker identity axioms) as a logical system for indistinguishable particles in contextual scenarios. Published a Book Chapter with J. R. B. Arenhart ⓘD

Undergraduate Research Assistant   2013–2014

Electromagnetic transport properties of nanostructures: Produced porous thin films of alumina via anodization processes. Used them as a matrix for electrodeposition of magnetic nanostructures.