**September 2019**

# Curriculum Vitae – Victor Hugo Souza

**Full Name**: Victor Hugo de Oliveira e Souza
**Gender:** Male; **Citizenship:** Brazilian
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**ORCID:** 0000-0002-0254-4322; **ResearcherID:** D-1611-2012; **Scopus ID:** 36476674200
**Google Scholar:** https://scholar.google.com.br/citations?user=hti4eAcAAAAJ&hl=en-US

## Current Position

**Postdoctoral researcher** 03/2018 – present
Department of Neuroscience and Biomedical Engineering, Aalto University, Espoo, Finland. Superior: Risto Ilmoniemi. Funding Agency: Jane & Aatos Erkko Foundation

**Project manager** 05/2019 – present
Department of Neuroscience and Biomedical Engineering, Aalto University, Espoo, Finland. Principal investigator: Risto Ilmoniemi. Project: Electronic–Robotic Perturb-and-Measure Brain Scanner. Funding Agency: Academy of Finland

## Education

**Doctor of Science in Physics Applied to Medicine and Biology** 2014 – 2018
University of São Paulo, Ribeirão Preto, Brazil. Thesis: Development of Instrumentation for Neuronavigation and Transcranial Magnetic Stimulation. Supervisor: Oswaldo Baffa Filho. Funding Agency: Brazilian Council for Scientific and Technological Development (CNPq)

**Master of Science in Physics Applied to Medicine and Biology** 2012 – 2014
University of São Paulo, Ribeirão Preto, Brazil. Thesis: Evaluation of Muscle Recruitment by High-Density Electromyography with Navigated Transcranial Magnetic Stimulation. Supervisor: Oswaldo Baffa Filho. Funding Agency: São Paulo Research Foundation (FAPESP)

**Bachelor of Science in Medical Physics** 2007 – 2011
University of São Paulo, Ribeirão Preto, Brazil

## Complementary Education

**Artificial Intelligence in Health Technologies** 2018
Aalto University, School of Science, Espoo, Finland. Course load: 135 hours

**4th Science Factory: TMS–EEG Summer School** 2016
Aalto University, School of Science, Espoo, Finland. Course load: 60 hours

**Coupling to the Dynamics of the Human Brain with TMS–EEG** 2013
Aalto University, School of Science, Espoo, Finland. Course load: 60 hours

**Spike sorting: What is it? Why do we need it? Where does it come from? How is it done? How to interpret it?** 2013
Institute of Mathematics and Statistics, University of São Paulo, São Paulo, Brazil. Course load: 6 hours

## Research and Professional Experience

**Doctoral student** 03/2014–02/2018
Department of Physics, University of São Paulo, Ribeirão Preto, Brazil. Funding Agency: Brazilian Council for Scientific and Technological Development

**Visiting graduate student** 11/2016–08/2017

Department of Neuroscience and Biomedical Engineering, Aalto University, Espoo, Finland, Funding Agency: Erasmus Mundus

**Training in Nuclear Medicine, Radiodiagnosis, Radioprotection, Radiotherapy, Magnetic Resonance Imaging and Ultrasonography** 05/2011–08/2011
Clinics Hospital of Ribeirão Preto Medical School, University of São Paulo. Duration: 300 Hours

**Scientific Initiation** 07/2008–12/2011
Laboratory of Biomagnetism, University of São Paulo, Ribeirão Preto, Brazil. Funding Agency: São Paulo Research Foundation (FAPESP) and Brazilian Council for Scientific and Technological Development (CNPq).

## Teaching Experience

**NBE-E4540 - Introduction to Scientific Visualization** 09/2019 – present
Department of Neuroscience and Biomedical Engineering, Aalto University. 5 ECTS credits.

**Class Tutoring in Nuclear Magnetic Resonance Applied to Biomedicine** 2015
Department of Physics, University of São Paulo. Duration: 140 Hours

**Class Tutoring in Nuclear Magnetic Resonance Applied to Biomedicine** 2015
Department of Physics, University of São Paulo. Duration: 140 Hours

**Class Tutoring in Physics 3 – Electricity and Magnetism** 2014
Department of Physics, University of São Paulo. Duration: 140 Hours

**Workshop in Neuronavigation and Transcranial Magnetic Stimulation** 2014
Federal University of Bahia, Salvador, Brazil. Duration: 40 hours

**Workshop in Development and Applications with InVesalius Navigator** 2014
Center for Information Technology Renato Archer, Campinas, Brazil. Duration: 16 hours

**Class Tutoring in Introduction to Biomedical Instrumentation** 2013
Department of Physics, University of São Paulo. Duration: 140 Hours

**Class Tutoring in Experimental Physics – Electricity and Magnetism** 2012
Department of Physics, University of São Paulo. Duration: 140 Hours

**Class Tutoring in Biophysics I** 2011
Department of Biology, University of São Paulo. Duration: 140 Hours

## Personal Research Funding and Grants

Brazilian Council for Scientific and Technological Development – R$ 110,328 (140787/2014-3; Personal grant) 03/2014–02/2018

Erasmus Mundus, SMART² Project – € 15,000 (SS16DM0736; Doctorate mobility) 11/2016–08/2017

São Paulo Research Foundation – R$ 31,852 (2012/11937-0; Personal grant) 09/2012–02/2014

São Paulo Research Foundation – R$ 12,294 (2009/09064-6; Personal grant) 10/2009–12/2011

Brazilian Council for Scientific and Technological Development – R$ 3,900 (124463/2008-8; Personal grant) 08/2008–09/2009

## Scientific Publication

List date: September 29, 2019. 10 scientific journal publications, 6 papers in conference proceeding, 2 book chapters, 1 patent application, 2 other writings. Google Scholar: 41 citations, h-index 4; Scopus: 18 citations, h-index 3.

### Research Papers

1. MATSUDA RH; TARDELLI GP; GUIMARÃES CO; **SOUZA VH**; BAFFA O. *Estimulação magnética transcraniana: uma breve revisão dos princípios e aplicações.* Revista Brasileira de Física Médica, v. 13, n.1, 2019. DOI:

10.29384/rbfm.2019.v13.n1.p49-56

2. NIEMINEN JO; KOPONEN LM; MÄKELÄ N; **SOUZA VH**; STENROOS M; ILMONIEMI RJ. Short-interval intracortical inhibition in human primary motor cortex: A multi-locus transcranial magnetic stimulation study. NeuroImage, v. 203, p. 116194, 2019. DOI: 10.1016/j.neuroimage.2019.116194

3. ZACHARIAS LR; PERES ASC; **SOUZA VH**; CONFORTO AB; BAFFA O. Method to assess the mismatch between the measured and nominal parameters of transcranial magnetic stimulation devices. Journal of Neuroscience Methods, v. 322, p. 83-87, 2019. DOI: 10.1016/j.jneumeth.2019.03.021

4. ZUGAIB J; **SOUZA VH**. *Transcranial magnetic stimulation for neuromodulation of the operculo-insular cortex in humans.* The Journal of Physiology, v. 597, p. 677-678, 2019. DOI: 10.1113/JP277415

5. **SOUZA VH**; VIEIRA TM; PERES ASC; GARCIA MAC; VARGAS CD; BAFFA O. *Effect of TMS coil orientation on the spatial distribution of motor evoked potentials in an intrinsic hand muscle.* Biomedizinische Technik/Biomedical Engineering, v. 63, p. 1-11, 2018. DOI: 10.1515/bmt-2016-0240

6. **SOUZA VH**; MATSUDA R; PERES A; AMORIM P; MORAES T; SILVA J; BAFFA O. *Development and characterization of the InVesalius Navigator software for navigated transcranial magnetic stimulation* Journal of Neuroscience Methods, p. 109-120, 2018. DOI: 10.1016/j.jneumeth.2018.08.023

7. PERES ASC; **SOUZA VH**; CATUNDA JMY; MAZZETO-BETTI KC; SANTOS-PONTELLI TEG; VARGAS CD; BAFFA O; DE ARAÚJO DB; PONTES-NETO OM; LEITE JP; GARCIA MAC. *Can somatosensory electrical stimulation relieve spasticity in post-stroke patients? A TMS pilot study*. Biomedizinische Technik/Biomedical Engineering, v. 63, p. 501-506, 2018. DOI: 10.1515/bmt-2016-0162

8. **SOUZA VH**; BAFFA O; GARCIA MAC. *Lateralized asymmetries in distribution of muscular evoked responses: An evidence of specialized motor control over an intrinsic hand muscle.* Brain Research, v. 1684, p. 60, 2018. DOI: 10.1016/j.brainres.2018.01.031

9. GRILLO FW; **SOUZA VH**; MATSUDA RH; RONDINONI C; PAVAN TZ; BAFFA O; MACHADO HR; CARNEIRO AAO. *Patient-specific neurosurgical phantom: assessment of visual quality, accuracy, and scaling effects.* 3D Printing in Medicine, v. 8, 3, 2018. DOI: 10.1186/s41205-018-0025-8

10. GARCIA MAC; **SOUZA VH**; VARGAS CD. *Can the Recording of Motor Potentials Evoked by Transcranial Magnetic Stimulation be Optimized?* Frontiers in Human Neuroscience, v. 11, p. 413, 2017. DOI: 10.3389/fnhum.2017.00413

**Articles in Conference Proceedings**

1. **SOUZA VH**; MATSUDA RH; GRILLO FW; RONDINONI C; MACHADO HR; CARNEIRO AAO; BAFFA O. Neuronavegação *com biomodelos multi-escala impressos em 3d para simulação cirúrgica*. In: XXV Congresso Brasileiro de Engenharia Biomédica, 2016, Foz do Iguaçú. Anais do XXV Congresso Brasileiro de Engenharia Biomédica, 2016. v. 1. p. 619-622.

2. PERES ASC; **SOUZA VH**; CATUNDA JMY; MAZZETTO-BETTI KC; SANTOS-PONTELLI TEG; VARGAS CD; PONTES-NETO OM; LEITE JP; GARCIA MAC. *Efeito da estimulação elétrica somatosensorial na excitabilidade corticoespinhal de pacientes espásticos*. In: XXV Congresso Brasileiro de Engenharia Biomédica, 2016, Foz do Iguaçú. Anais do XXV Congresso Brasileiro de Engenharia Biomédica, 2016. v. 1. p. 1482-1485.

3. RONDINONI C; **SOUZA VHO**; HIROSHI RM; PERES ASC; SANTOS MV; BAFFA O; DOS-SANTOS AC; MACHADO HR; NORITOMI PY; SILVA JVL. Inter-institutional protocol describing the use of three-dimensional printing for surgical planning in a patient with childhood epilepsy: From 3D modeling to neuronavigation. 2014 IEEE 16th International Conference on e-Health Networking, Applications and Services (Healthcom) (Springer, Volume 1, pg. 347-349) (Natal – Brazil). DOI: 10.1109/HealthCom.2014.7001866

4. BAFFA O; **SOUZA VHO**. Biomagnetismo: uma alternativa para o estudo de sistemas biológicos. Encuentro de Fisica: Las fronteras de la Fisica en Latinoamérica 2013 (Quito – Ecuador). Memorias.

5. PERES ASC; **SOUZA VHO**; RODRIGUES EM; SALMON CEG; ARAUJO DB; BAFFA O. *Real-Time Spatial Localization System of Brains Regions for TMS Application by Co-registration with fMRI*. 17th International Conference on Biomagnetism Advances in Biomagnetism – Biomag 2010 (Dubrovnik – Croatia). IFMBE Proceedings (Springer, Volume 28, pages. 92-96). DOI: 10.1007/978-3-642-12197-5_17

6. PERES ASC; **SOUZA VHO**; RODRIGUES EM; MAZIERO D; ARAUJO DB; SALMON CEG; BAFFA O. *Vector Magnetic*

*Field Mapping of a Transcranial Magnetic Stimulation Coil Using Magnetic Resonance Imaging: in-vitro and in-vivo Experiments*. World Congress on Medical Physics and Biomedical Engineering – 2009 (Munich – Germany). IFMBE Proceedings (Springer, Volume 25/VII, pages. 571-574). DOI: 10.1007/978-3-642-03885-3_159

**Abstract in Conference Proceedings**

1. **SOUZA V;** NIEMINEN J; TUGIN S; KOPONEN L; BAFFA O; ILMONIEMI R. *Multi-locus TMS transducer for probing orientation dependency of mechanisms in the primary motor cortex.* Brain Stimulation, v. 12, p. 467, 2019. DOI: 10.1016/j.brs.2018.12.522

2. **SOUZA V**; MATSUDA R; PERES A; AMORIM P; MORAES T; SILVA J; BAFFA O. *InVesalius Navigator, a free and open-source software for navigated transcranial magnetic stimulation.* Brain Stimulation, v. 12, p. 571, 2019. DOI: 10.1016/j.brs.2018.12.894

3. **SOUZA V**; BAFFA O; GARCIA M. *Evidence of asymmetrical spatial distributions of motor evoked potentials between dominant and non-dominant hands*. Brain Stimulation, v. 12, p. 423-424, 2019. DOI: 10.1016/j.brs.2018.12.373

4. **SOUZA VHO**; RODRIGUES EM; PERES ASC; AMORIM PHJ; MORAES TF; MARTINS TACP; SILVA JVL; BAFFA O. *Neuronavigation software for transcranial magnetic stimulation*. 18th International Conference on Medical Physics, Porto Alegre, Brazil. Brazilian Journal of Medical Physics – Proceedings of the 18th International Conference on Medical Physics, XVI Brazilian Congress of Medical Physics e V Instrumentation and Medical Imaging Symposium (ABFM, Volume 5, page 83).

**Book Chapters**

1. **SOUZA VHO**; RODRIGUES EM; PERES ASC; SALMON CEG; BAFFA O. *Estimulação Magnética Transcraniana Assistida por um Neuronavegador com Co-registro de Campo Magnético da Bobina de Estimulação e Imagens de Ressonância Magnética*. Neurociências e Epilepsia (Editora Plêiade, Volume 2, pág. 153-159).

2. PERES ASC; **SOUZA VHO**; RODRIGUES EM; MAZIERO D; SALMON CEG; BAFFA O. *Ressonância Magnética para o Mapeamento Vetorial de Campos Produzidos em Estimulação Magnética Transcraniana Utilizando Experimentos in-vitro e in-vivo*. Neurociências e Epilepsia (Editora Plêiade, Volume 2, pág. 161-166).

**Other Materials**

1. Educational material. Biomagnetismo: Aspectos instrumentais e Aplicações (2011). University of São Paulo, Ribeirão Preto, Brazil.

2. Educational material. Estimulação Magnética Transcraniana (2011). University of São Paulo, Ribeirão Preto, Brazil.

## Technical Production

**Patents**

1. PERES ASC; **SOUZA VHO**; BAFFA O; RODRIGUES EM; ARAUJO DB; MARTINS TACP; AMORIM PHJ; MORAES TF; SILVA JVL. Sistema para Navegação Virtual e Co-registro de Corpos Rígidos e seus Modelos Virtuais e Método para a Determinação das Coordenadas Comuns aos Componentes do Sistema. Deposit Date: 04/10/2013. Registry: BR1020130256510. Depositor**:** University of São Paulo

**Open-source Software**

1. **SOUZA VH**; PERES ASC; RAKAUSKAS LZ; BAFFA O. Signal Hunter (2014). Language: MATLAB. DOI: 10.5281/zenodo.1326308

2. **SOUZA VH**; PERES ASC; RAKAUSKAS LZ; BAFFA O. MEP Hunter (2013). Language: MATLAB. Distribution: https://github.com/biomaglab/mephunter

3. **SOUZA VH**; RODRIGUES EM; PERES ASC; AMORIM PHJ; MORAES TF; MARTINS TACP; ARAUJO DB; SILVA JVL; BAFFA O. InVesalius Navigator (2011). Language: Python. DOI: 10.5281/zenodo.1326396

## Other Scientific Merits

**Supervision experience**

1. Student: Malmi, Mikko; Bachelor's thesis; Supervisor: Jani-Petri Martikainen; Aalto University, Finland (05/2019 – present).
2. Student: Cuziol, Vitor; Bachelor's thesis; Supervisor: Prof. Oswaldo Baffa; University of São Paulo, Brazil (05/2015–10/2016).

**Reviewer experience**

1. Journal of Neural Engineering (2019 – present)
2. Plos One (2019 – present)
3. Journal of Neuroscience Methods (2019 – present)

**Member in examination board for master's degree**

1. Candidate: Fernandes, Ana Cecília Sá; Supervisor: Prof. André S. C. Peres, International; International Institute for Neurosciences of Natal - Edmond and Lily Safra, Natal, Brazil (07/2019).
2. Candidate: Rossi, Bárbara Palmeira; Supervisor: Prof. Diogo C. Felício; Federal University of Juiz de Fora, Juiz de Fora, Brazil (05/2018).

**Memberships in scientific societies**

1. Brazilian Physical Society: regular member no. 34313 (2016-2017)

**Awards**

1. Honorable mention in VI Workshop CIInAPCe (2012) for the study entitled: *Avaliação do Potencial Evocado Motor por Eletromiografia de Alta Densidade em Aplicações de Estimulação Magnética Transcraniana em Diferentes Orientações*.

## Experience of organizing scientific meetings

**7th TMS–EEG Summer School and Workshop (Member of organizing team)** 2019
Aalto University, Espoo, Finland. Participants: 40

**6th TMS–EEG Summer School and Workshop (Member of organizing team)** 2018
Aalto University, Espoo, Finland. Participants: 40

**5th TMS–EEG Summer School and Workshop (Member of organizing team)** 2017
Aalto University, Espoo, Finland. Participants: 40

**II Winter school on Physics Applied to Medicine and Biology (Main coordinator)** 2016
University of São Paulo, Ribeirão Preto, Brazil. Participants: 68

**XIV Week on Medical Physics (Main coordinator)** 2015
University of São Paulo, Ribeirão Preto, Brazil. Participants: 135

## Languages

**Mother tongue**: Portuguese

**Other languages:** English (C2), Spanish (B2), Finnish (A2)