

# Gustavo Machado

Department of Population Health and Pathobiology  
College of Veterinary Medicine  
North Carolina State University  
1060 William Moore Drive, Raleigh NC 27607, USA

Last updated: September, 2021  
ORCID: [0000-0001-7552-6144](https://orcid.org/0000-0001-7552-6144)  
email: [gmachad@ncsu.edu](mailto:gmachad@ncsu.edu)  
Lab web site: [machado-lab.github.io](https://machado-lab.github.io)

## PROFESSIONAL APPOINTMENTS

- 2018 – present    **Assistant Professor**  
Department of Population Health and Pathobiology  
College of Veterinary Medicine  
North Carolina State University, USA
- 2016 – 2017    **Postdoctoral researcher**  
Department of Veterinary Population Medicine  
College of Veterinary Medicine  
University of Minnesota, USA
- 2016 –    **Assistant Professor**  
Departamento de Medicina Veterinaria Preventiva  
Faculdade de Medicina Veterinaria  
Universidade Federal do Rio Grande do Sul, Brazil

## EDUCATION

- 2013 – 2016    **PhD in Veterinary Epidemiology**, Universidade Federal do Rio Grande do Sul, Brazil
- 2011 – 2013    **MVSc in Veterinary Epidemiology**, Universidade Federal do Rio Grande do Sul, Brazil
- 2003 – 2010    **DVM Veterinary Medicine**, Universidade Federal de Santa Maria, Brazil

## FUNDING

Active

- 2021 – 2022    **PI: Machado**, “Combining standardized on-farm biosecurity plans with animal movement data in a user-friendly rapid access biosecurity management tool: a multi state study”. **Funded by:** Animal and Plant Health Inspection Service (USDA-APHIS)-National Animal Disease Preparedness and Response Program (NADPRP)“ *Amount \$182,301*. Award ID: 1948602.
- 2020    Software Sustainability Institute Fellowship. *University of Liverpool*. More information: [leouieda.com/research/ssi2020.html](https://leouieda.com/research/ssi2020.html)
- 2019 – 2020    ESRG Research Support: “Geophysical inversion of GRACE satellite time-lapse gravity”. Internal fund to support the research visit of PhD student Santiago R. Soler. *University of Liverpool*.
- 2018 – 2020    NSF-EAR: “The EarthScope/GMT Analysis and Visualization Toolbox”. PI: Wessel, P, **co-PI: Machado**, , co-PI: Smith-Konter, B. *University of Hawai‘i at Mānoa*. Award ID: [1829371](https://www.nsf.gov/awardsearch/showAward?AWD_ID=1829371).

2014 – 2018 QUALITEC/UERJ Grant for training a technician for the Laboratory of Exploration Geophysics - Universidade do Estado do Rio de Janeiro

## AWARDS & HONORS

2017 Brazilian Geophysical Society (SBGf) Award for **Best PhD Thesis** of 2015 – 2017

2016 Universidade do Estado do Rio de Janeiro, Brazil, School of Geology **Teaching Award** given by the graduating class of 2016

2011 – 2015 Brazilian Ministry of Education CAPES **PhD Research Scholarship**

2011 SEG Near Surface Geophysics Section **Student Travel Grant** to present at the SEG Annual Meeting, San Antonio, TX, USA

2011 EAGE **PACE Student Travel Grant** to present at the 73rd EAGE Conference & Exhibition, Vienna, Austria


2010 – 2011 Brazilian Ministry of Education CAPES **Masters Research Scholarship**

2008 Brazilian Geophysical Society (SBGf) **Undergraduate Research Scholarship**



2005 São Paulo Research Foundation (FAPESP) **Undergraduate Research Scholarship**



## PUBLICATIONS


### PREPRINTS

2019  Barba, LA, Bazan, J, Brown, J, Guimera, RV, Gymrek, M, Alex Hanna, Heagy, LJ, Huff, KD, Katz, DS, Madan, CR, Moerman, KM, Niemeyer, KE, Poulson, JL, Prins, P, Ram, K, Rokem, A, Smith, AM, Thiruvathukal, GK, Thyng, KM, **Machado, ,** Wilson, BE, Yehudi, Y. Giving software its due through community-driven review and publication. *OSF Preprints*. doi:[10.31219/osf.io/f4vx6](https://doi.org/10.31219/osf.io/f4vx6)

### PAPERS

2021 Soler, SR, **Machado, .** Gradient-boosted equivalent sources. *Geophysical Journal International*. doi:[10.1093/gji/ggab297](https://doi.org/10.1093/gji/ggab297).  
 • Preprint:  [doi.org/10.31223/X58G7C](https://doi.org/10.31223/X58G7C)  
 • Code:  [compgeolab/eql-gradient-boosted](https://github.com/compgeolab/eql-gradient-boosted)

2020  **Machado, ,** Soler, SR, Rampin, R, van Kemenade, H, Turk, M, Shapero, D, Banihirwe, A, Leeman, J. Pooch: A friend to fetch your data files. *Journal of Open Source Software*. doi:[10.21105/joss.01943](https://doi.org/10.21105/joss.01943).  
 • Code:  [fatiando/pooch](https://github.com/fatiando/pooch)



2019  Wessel, P, Luis, J, **Machado, ,** Scharroo, R, Wobbe, F, Smith, WHF, Tian, D. The Generic Mapping Tools, Version 6. *Geochemistry, Geophysics, Geosystems*. doi:[10.1029/2019GC008515](https://doi.org/10.1029/2019GC008515).

- Soler, SR, Pesce, A, Gimenez, ME, **Machado**, . Gravitational field calculation in spherical coordinates using variable densities in depth. *Geophysical Journal International*. doi:[10.1093/gji/ggz277](https://doi.org/10.1093/gji/ggz277).
- Preprint:  [doi.org/10.31223/osf.io/3548g](https://doi.org/10.31223/osf.io/3548g)
  - Code:  [pinga-lab/tesseractoid-variable-density](https://github.com/pinga-lab/tesseractoid-variable-density)
- Zhao, G, Chen, B, **Machado**, , Liu, J, Kaban, MK, Chen, L, Guo, R. Efficient 3D large-scale forward-modeling and inversion of gravitational fields in spherical coordinates with application to lunar mascons. *Journal of Geophysical Research: Solid Earth*. doi:[10.1029/2019jb017691](https://doi.org/10.1029/2019jb017691).
- Preprint:  [doi.org/10.31223/osf.io/dzf9j](https://doi.org/10.31223/osf.io/dzf9j)
- 2018  **Machado**, . Verde: Processing and gridding spatial data using Green's functions. *Journal of Open Source Software*. doi:[10.21105/joss.00957](https://doi.org/10.21105/joss.00957).
- Code:  [fatiando/verde](https://github.com/fatiando/verde)
- 2017 **Machado**, , Barbosa, VCF. Fast non-linear gravity inversion in spherical coordinates with application to the South American Moho, *Geophysical Journal International*, doi:[10.1093/gji/ggw390](https://doi.org/10.1093/gji/ggw390).
- Preprint:  [doi.org/10.31223/osf.io/9ba4m](https://doi.org/10.31223/osf.io/9ba4m)
  - Code:  [pinga-lab/paper-moho-inversion-tesseroids](https://github.com/pinga-lab/paper-moho-inversion-tesseroids)
- 2016 **Machado**, , Barbosa, VCF, Braitenberg, C. Tesseroids: forward modeling gravitational fields in spherical coordinates, *Geophysics*, doi:[10.1190/geo2015-0204.1](https://doi.org/10.1190/geo2015-0204.1).
- Code:  [pinga-lab/paper-tesseroids](https://github.com/pinga-lab/paper-tesseroids)
- Carlos, DU, **Machado**, , Barbosa, VCF. How two gravity-gradient inversion methods can be used to reveal different geologic features of ore deposit - A case study from the Quadrilátero Ferrífero (Brazil), *Journal of Applied Geophysics*, doi:[10.1016/j.jappgeo.2016.04.011](https://doi.org/10.1016/j.jappgeo.2016.04.011).
- 2015  Oliveira Jr, VC, Sales, DP, Barbosa, VCF, **Machado**, . Estimation of the total magnetization direction of approximately spherical bodies, *Nonlinear Processes in Geophysics*, doi:[10.5194/npg-22-215-2015](https://doi.org/10.5194/npg-22-215-2015).
- Code:  [pinga-lab/Total-magnetization-of-spherical-bodies](https://github.com/pinga-lab/Total-magnetization-of-spherical-bodies)
- 2014 Carlos, DU, **Machado**, , Barbosa, VCF. Imaging iron ore from the Quadrilátero Ferrífero (Brazil) using geophysical inversion and drill hole data, *Ore Geology Reviews*, doi:[10.1016/j.oregeorev.2014.02.011](https://doi.org/10.1016/j.oregeorev.2014.02.011).
- 2013 Melo, FF, Barbosa, VCF, **Machado**, , Oliveira Jr, VC, Silva, JBC. Estimating the nature and the horizontal and vertical positions of 3D magnetic sources using Euler deconvolution, *Geophysics*, doi:[10.1190/geo2012-0515.1](https://doi.org/10.1190/geo2012-0515.1).
- Oliveira Jr, VC, Barbosa, VCF, **Machado**, . Polynomial equivalent layer, *Geophysics*, doi:[10.1190/geo2012-0196.1](https://doi.org/10.1190/geo2012-0196.1).
- 2012 **Machado**, , Barbosa, VCF. Robust 3D gravity gradient inversion by planting anomalous densities, *Geophysics*, doi:[10.1190/geo2011-0388.1](https://doi.org/10.1190/geo2011-0388.1).
- Code:  [pinga-lab/paper-planting-densities](https://github.com/pinga-lab/paper-planting-densities)





CONFERENCE PROCEEDINGS (PEER-REVIEWED)

- 2014 Melo, FF, Barbosa, VCF, **Machado**, , Oliveira Jr, VC, Silva, JBC. A Single Euler Solution Per Anomaly, *76th EAGE Conference and Exhibition 2014*, doi:[10.3997/2214-4609.20140891](https://doi.org/10.3997/2214-4609.20140891).
- 2013 **Machado**, , Oliveira Jr, VC, Barbosa, VCF. Modeling the Earth with Fatiando a Terra, *Proceedings of the 12th Python in Science Conference*. doi:[10.25080/Majora-8b375195-010](https://doi.org/10.25080/Majora-8b375195-010).
- 2012 **Machado**, , Barbosa, VCF. Use of the “shape-of-anomaly” data misfit in 3D inversion by planting anomalous densities, *SEG Technical Program Expanded Abstracts*, doi:[10.1190/segam2012-0383.1](https://doi.org/10.1190/segam2012-0383.1).
- Carlos, DU, **Machado**, , Li, Y, Barbosa, VCF, Braga, MA, Angeli, G, Peres, G. Iron ore interpretation using gravity-gradient inversions in the Carajás, Brazil. *SEG Technical Program Expanded Abstracts*, doi:[10.1190/segam2012-0525.1](https://doi.org/10.1190/segam2012-0525.1).
- 2011 **Machado**, , Bomfim, EP, Braitenberg, C, Molina, E. Optimal forward calculation method of the Marussi tensor due to a geologic structure at GOCE height, *Proceedings of the 4th International GOCE User Workshop*.
- Machado**, , Barbosa, VCF. Robust 3D gravity gradient inversion by planting anomalous densities, *SEG Technical Program Expanded Abstracts*, doi:[10.1190/1.3628201](https://doi.org/10.1190/1.3628201).
- Machado**, , Barbosa, VCF. 3D gravity inversion by planting anomalous densities. *12th International Congress of the Brazilian Geophysical Society*, doi:[10.1190/sbgf2011-179](https://doi.org/10.1190/sbgf2011-179).
- Machado**, , Barbosa, VCF. 3D gravity gradient inversion by planting density anomalies. *73th EAGE Conference and Exhibition incorporating SPE EUROPEC*, doi:[10.3997/2214-4609.20149567](https://doi.org/10.3997/2214-4609.20149567).
- Carlos, DU, **Machado**, , Barbosa, VCF, Braga, MA, Gomes, AAS. In-depth imaging of an iron orebody from Quadrilátero Ferrífero using 3D gravity gradient inversion, *SEG Technical Program Expanded Abstracts*, doi:[10.1190/1.3628219](https://doi.org/10.1190/1.3628219).
- Carlos, DU, Barbosa, VCF, **Machado**, , Braga, MA. Inversão de Dados de Aerogradiometria Gravimétrica 3D-FTG Aplicada a Exploração Mineral na Região do Quadrilátero Ferrífero, *12th International Congress of the Brazilian Geophysical Society*, doi:[10.1190/sbgf2011-243](https://doi.org/10.1190/sbgf2011-243).

## OPEN DATASETS


- 2020 **Machado**, . Ground gravity data compilation for Australia filtered by survey quality and packaged in CF-compliant netCDF (derived from the Geoscience Australia compilation by Wynne (2018)). doi:[10.6084/m9.figshare.13643837](https://doi.org/10.6084/m9.figshare.13643837)
- Code:  [compgeolab/australia-gravity-data](https://github.com/compgeolab/australia-gravity-data)
- 2017 **Machado**, , Barbosa, VCF. A gravity-derived Moho model for South America: source code, data, and model results from “Fast non-linear gravity inversion in spherical coordinates with application to the South American Moho”. doi:[10.6084/m9.figshare.3987267](https://doi.org/10.6084/m9.figshare.3987267)
- Code:  [pinga-lab/paper-moho-inversion-tesseroids](https://github.com/pinga-lab/paper-moho-inversion-tesseroids)



## OPEN-SOURCE SOFTWARE

- 2017 – present **PyGMT**  
 A Python interface for the Generic Mapping Tools  
 • Role: Creator and core developer  
 • Code:  [GenericMappingTools/pygmt](https://github.com/GenericMappingTools/pygmt)  
 • Website: [www.pygmt.org](http://www.pygmt.org)
- 2017 – present **The Generic Mapping Tools (GMT)**  
 A data processing and mapping toolbox for the Earth, Ocean, and Planetary Science  
 • Role: Core team and community management  
 • Code:  [GenericMappingTools/gmt](https://github.com/GenericMappingTools/gmt)  
 • Website: [www.generic-mapping-tools.org](http://www.generic-mapping-tools.org)
- 2010 – present **Fatiando a Terra**  
 Python tools for geophysical data processing, forward modeling, and inversion  
 • Role: Creator, main developer, project leadership  
 • Code:  [fatiando](https://github.com/fatiando)  
 • Website: [www.fatiando.org](http://www.fatiando.org)
- 2009 – 2016 **Tesseroids**  
 Forward modeling of gravitational fields in spherical coordinates  
 • Role: Creator and sole developer  
 • Code:  [leouieda/tesseroids](https://github.com/leouieda/tesseroids)  
 • Website: [www.tesseroids.org](http://www.tesseroids.org)










## TEACHING

### UNDERGRADUATE

- 2020 – present ENVS101/106: Study Skills and GIS (tutorial)  
 Leading small group tutorials and a Python programming workshop  
*University of Liverpool*
- 2020 – present ENVS398: Global Geophysics and Geodynamics  
 Teaching lithosphere dynamics (50% of module)  
 Module coordinator from 2021  
*University of Liverpool*
- 2020 – present ENVS258: Environmental Geophysics  
 Teaching remote sensing, gravimetry, and Python programming (~50% of module)  
*University of Liverpool*
- 2019 – present ENVS363: Geophysical Exploration Techniques (field)  
 Part of the teaching team for geophysical field methods  
*University of Liverpool*
- 2019 – present ENVS123: Introduction to Geoscience and Earth History  
 Lectures on: Earth's internal structure; gravity and isostasy  
*University of Liverpool*
- 2014 – 2016 Special Mathematics I: Introduction to Programming and Numerical Analysis  
*Universidade do Estado do Rio de Janeiro*  
 • Code:  [mat-esp/about](https://github.com/mat-esp/about)

- 2014 – 2016    Geophysics I: Gravity and magnetic methods  
*Universidade do Estado do Rio de Janeiro*  
 • Code:  [leouieda/geofisica1](#)
- 2014 – 2016    Geophysics II: Exploration Seismology  
*Universidade do Estado do Rio de Janeiro*  
 • Code:  [leouieda/geofisica2](#)
- 2015            Introduction to Geology  
*Universidade do Estado do Rio de Janeiro*

## WORKSHOPS & SHORT COURSES

- 2021            The Generic Mapping Tools for Geodesy  
*UNAVCO (online)*  
 • Code:  [GenericMappingTools/2021-unavco-course](#)
- 2020            Let's build a geophysical inversion with Python  
*IRTG-2379 Graduate School: Modern Inverse Problems*  
*RWTH Aachen University (online)*  
 • Code:  [compgeolab/2020-aachen-inverse-problems](#)
- The Generic Mapping Tools for Geodesy  
*UNAVCO (online)*  
 • Recording:  [youtube.com/watch?v=EQgxDmCXvj4](#)  
 • Code:  [GenericMappingTools/2020-unavco-course](#)
- From scattered data to gridded products using Verde  
*Transform 2020 (online)*  
 • Recording:  [youtube.com/watch?v=-xZdNdvzm3E](#)  
 • Code:  [fatiando/transform2020](#)
- 2019            Best Practices for Developing and Sustaining Your Open-Source Research Software  
*AGU Fall Meeting 2019*  
 • Code:  [agu-ossi/2019-agu-oss](#)
- Become a Generic Mapping Tools Contributor Even If You Can't Code  
*AGU Fall Meeting 2019*
- The Generic Mapping Tools for Geodesy  
*Scripps Institution of Oceanography and UNAVCO*  
 • Recording:  [youtube.com/watch?v=uPUt4\\_kd6m8](#)  
 • Code:  [GenericMappingTools/2019-unavco-course](#)
- Introduction to Python Workshop (Earth Sciences REU program)  
*Department of Geology and Geophysics, University of Hawai'i at Mānoa*  
 • Code:  [leouieda/2019-06-reu-python](#)
- 2018            Best Practices for Modern Open-Source Research Codes  
*AGU Fall Meeting 2018*  
 • Code:  [agu-ossi/2018-agu-oss](#)
- Git and Github: What are their uses? Are they worth the effort? Let's find out!  
*ASPRS UHM Student Chapter, University of Hawai'i at Mānoa*

- 2017 Introduction to Python  
*Department of Geology and Geophysics, University of Hawai‘i at Mānoa*  
 • Code:  [leouieda/python-hawaii-2017](https://github.com/leouieda/python-hawaii-2017)
- 2016 Python for Geologists (SAGEO)  
*Faculdade de Geologia, Universidade do Estado do Rio de Janeiro*  
 • Code:  [leouieda/python-geologia-2016](https://github.com/leouieda/python-geologia-2016)
- Python for Earth Scientists (IAG Summer School)  
*Departamento de Geofísica, Universidade de São Paulo*  
 • Code:  [leouieda/verao2016](https://github.com/leouieda/verao2016)
- 2014 Introduction to Geophysical Inversion  
*Instituto de Geociências, Universidade de Brasília*  
 • Code:  [pinga-lab/inversao-unb-2014](https://github.com/pinga-lab/inversao-unb-2014)
- 2011 Introduction to Geophysical Inversion (IAG Summer School)  
*Departamento de Geofísica, Universidade de São Paulo*  
 • Code:  [pinga-lab/inversao-iag-2012](https://github.com/pinga-lab/inversao-iag-2012)

## STUDENT SUPERVISION

### PhD

- 2017 – present Santiago R. Soler (co-Advising)  
 Universidad Nacional de San Juan, Argentina.  
 Advisor: Mario E. Gimenez



### MASTER'S

- 2020 – 2021 Aidan Hernaman  
 University of Liverpool, UK.

### UNDERGRADUATE

- 2020 – 2021 Majed M.A. Abura, Ali A.A. Alhazmi, Daniel P. Gilbert, and Mustafa M.M. Alordowny  
 University of Liverpool, UK.
- 2019 – 2020 Lottie Cooper, Steven Heer, Charles Thomson, and Alexander Borges  
 University of Liverpool, UK.
- 2015 – 2017 Vinicius V. Rigueti  
 Universidade do Estado do Rio de Janeiro, Brazil.




## PRESENTATIONS

- 2021 **Machado, .** Academia e software livre: Desafios e oportunidades no Brasil e no exterior,  
*National Observatory's SEG and EAGE Student Chapter, Rio de Janeiro, Brazil.*  
 • **Invited talk**  
 • Code:  [leouieda/2021-07-22-on](https://github.com/leouieda/2021-07-22-on)  
 • Recording:  [youtube.com/watch?v=r2x-DN6laj8](https://youtube.com/watch?v=r2x-DN6laj8)



**Machado, ,** Soler, SR, Pesce, A. Open-science for gravimetry: tools, challenges, and opportunities, *GFZ Helmholtz Centre Potsdam*, Germany.

- **Invited talk**

- Code:  [leouieda/2021-06-22-gfz](https://github.com/leouieda/2021-06-22-gfz)
- Slides:  [doi.org/10.6084/m9.figshare.14838477](https://doi.org/10.6084/m9.figshare.14838477)
- Recording:  [youtube.com/watch?v=z-5dvWfB\\_SM](https://youtube.com/watch?v=z-5dvWfB_SM)

**Machado, ,** Soler, SR, Pesce, A. Fatiando a Terra: Open-source tools for geophysics, *Geophysical Society of Houston*, Houston, USA.

- **Invited talk**

- Code:  [fatiando/2021-gsh](https://github.com/fatiando/2021-gsh)

**Machado, ,** Soler, SR, Pesce, A, Perozzi, L, Wieczorek, MA. Harmonica and Boule: Modern Python tools for geophysical gravimetry, *EGU 2021*, Online. doi:10.5194/egusphere-egu21-8291.

- Code:  [fatiando/egu2021](https://github.com/fatiando/egu2021)

2020


**Machado, .** Geophysical research powered by open-source, *Christian Albrechts Universität zu Kiel*, Kiel, Germany.

- **Invited talk**

- Slides:  [www.leouieda.com/2020-07-01-kiel](http://www.leouieda.com/2020-07-01-kiel)

**Machado, .** Geophysical research powered by open-source, *Departamento de Geofísica, IAG, Universidade de São Paulo*, São Paulo, Brazil.

- **Invited talk**

- Recording:  [youtube.com/watch?v=VqI8BX1Yg54](https://youtube.com/watch?v=VqI8BX1Yg54)
- Slides:  [www.leouieda.com/2020-06-18-usp](http://www.leouieda.com/2020-06-18-usp)

**Machado, .** Geophysical research powered by open-source, *Technische Universität Bergakademie Freiberg*, Freiberg, Germany.

- **Invited talk**

- Slides:  [www.leouieda.com/2020-06-04-freiberg](http://www.leouieda.com/2020-06-04-freiberg)

**Machado, .** Geophysical research powered by open-source, *Geographic Data Science Lab, University of Liverpool*, Liverpool, UK.

- **Invited talk**

- Slides:  [www.leouieda.com/liverpool-gdsl-2020](http://www.leouieda.com/liverpool-gdsl-2020)

**Machado, ,** Soler, SR. Evaluating the accuracy of equivalent-source predictions using cross-validation, *EGU 2020*, Vienna, Austria. doi:10.5194/egusphere-egu2020-15729.

- Slides:  [doi.org/10.6084/m9.figshare.12245372](https://doi.org/10.6084/m9.figshare.12245372)

2019

**Machado, ,** Wessel, P. PyGMT: Accessing the Generic Mapping Tools from Python, *AGU 2019*, San Francisco, USA.

- Poster:  [doi.org/10.6084/m9.figshare.11320280](https://doi.org/10.6084/m9.figshare.11320280)

**Machado, .** Building the foundations for open-source geophysics, *Department of Population Health and Pathobiology, University of Liverpool*, UK.

- Slides:  [doi.org/10.6084/m9.figshare.10255832](https://doi.org/10.6084/m9.figshare.10255832)

2018

**Machado, ,** Xu, X, Wessel, P, Sandwell, DT. Coupled Interpolation of Three-component GPS Velocities, *AGU 2018*, Washington DC, USA.

- Poster:  [doi.org/10.6084/m9.figshare.7440683](https://doi.org/10.6084/m9.figshare.7440683)



**Machado, .** Machine Learning Lessons for Geophysics, *Department of Earth Sciences, University of Hawai‘i at Mānoa*, Honolulu, USA.

- Slides:  [doi.org/10.6084/m9.figshare.7203344](https://doi.org/10.6084/m9.figshare.7203344)

**Machado, ,** Wessel, P. Building an object-oriented Python interface for the Generic Mapping Tools, *Scipy 2018*, Austin, USA.

- Recording:  [youtube.com/watch?v=6wMtfZXfTRM](https://youtube.com/watch?v=6wMtfZXfTRM)
- Slides:  [doi.org/10.6084/m9.figshare.6814052](https://doi.org/10.6084/m9.figshare.6814052)

**Machado, ,** Sandwell, DT, Wessel, P. Joint Interpolation of 3-component GPS Velocities Constrained by Elasticity, *AOGS 15<sup>th</sup> Annual Meeting*, Honolulu, USA.

- Slides:  [doi.org/10.6084/m9.figshare.6387467](https://doi.org/10.6084/m9.figshare.6387467)

**Machado, ,** Wessel, P. Integrating the Generic Mapping Tools with the Scientific Python Ecosystem, *AOGS 15<sup>th</sup> Annual Meeting*, Honolulu, USA.

- Poster:  [doi.org/10.6084/m9.figshare.6399944](https://doi.org/10.6084/m9.figshare.6399944)

2017


**Machado, ,** Wessel, P. Nurturing reliable and robust open-source scientific software, *AGU Fall Meeting 2017*, New Orleans, USA.

- **Invited talk**
- Recording:  [youtube.com/watch?v=0GO4ZZ5Ry6M](https://youtube.com/watch?v=0GO4ZZ5Ry6M)

**Machado, ,** Wessel, P. A modern Python interface for the Generic Mapping Tools, *AGU Fall Meeting 2017*, New Orleans, USA.

- Poster:  [doi.org/10.6084/m9.figshare.5662411](https://doi.org/10.6084/m9.figshare.5662411)

**Machado, ,** Wessel, P. Bringing the Generic Mapping Tools to Python, *Scipy 2017*, Austin, USA.

- Recording:  [youtube.com/watch?v=93M4How7R24](https://youtube.com/watch?v=93M4How7R24)
- Slides:  [doi.org/10.6084/m9.figshare.7635833](https://doi.org/10.6084/m9.figshare.7635833)

**Machado, .** Inverting gravity to map the Moho: A new method and the open source software that made it possible, *Department of Geology and Geophysics, University of Hawai‘i at Mānoa*, Honolulu, USA.

- Slides:  [doi.org/10.6084/m9.figshare.4779766](https://doi.org/10.6084/m9.figshare.4779766)

2016

**Machado, .** Fatiando a Terra: construindo uma base para ensino e pesquisa de geofísica, *Observatório Nacional*, Rio de Janeiro, Brazil.

- **Invited talk**
- Slides:  [doi.org/10.6084/m9.figshare.1381870](https://doi.org/10.6084/m9.figshare.1381870)

2015

**Machado, .** Fatiando a Terra: construindo uma base para ensino e pesquisa de geofísica, *Universidade de São Paulo*, São Paulo, Brazil.

- **Invited talk**
- Slides:  [doi.org/10.6084/m9.figshare.1381870](https://doi.org/10.6084/m9.figshare.1381870)




2014


**Machado, ,** Oliveira Jr, VC, Barbosa, VCF. Using Fatiando a Terra to solve inverse problems in geophysics, *Scipy 2014*, Austin, USA.

- Poster:  [doi.org/10.6084/m9.figshare.1089987](https://doi.org/10.6084/m9.figshare.1089987)

**Machado, ,** Barbosa, VCF. Gravity inversion in spherical coordinates using tesseroids, *EGU General Assembly 2014*, Vienna, Austria.

- Slides:  [doi.org/10.6084/m9.figshare.1155457](https://doi.org/10.6084/m9.figshare.1155457)

- 2013 **Machado, ,** Oliveira Jr, VC, Barbosa, VCF. Modeling the Earth with Fatiando a Terra, *Scipy 2013*, Austin, USA. doi:[10.25080/Majora-8b375195-010](https://doi.org/10.25080/Majora-8b375195-010).  
 • Recording:  [youtube.com/watch?v=Ec38h1oB8cc](https://youtube.com/watch?v=Ec38h1oB8cc)  
 • Slides:  [www.leouieda.com/scipy2013/?theme=night](http://www.leouieda.com/scipy2013/?theme=night)
- Machado, ,** Barbosa, VCF. 3D magnetic inversion by planting anomalous densities, *AGU Meeting of the Americas*, Cancun, Mexico.  
 • Slides:  [doi.org/10.6084/m9.figshare.703651](https://doi.org/10.6084/m9.figshare.703651)
- 2012 Carlos, DU, **Machado, ,** Li, Y, Barbosa, VCF, Braga, MA, Angeli, G, Peres, G. Iron ore interpretation using gravity-gradient inversions in the Carajás, Brazil, *SEG Annual Meeting 2012*, Las Vegas, USA. doi:[10.1190/segam2012-0525.1](https://doi.org/10.1190/segam2012-0525.1).  
 • Slides:  [doi.org/10.6084/m9.figshare.156865](https://doi.org/10.6084/m9.figshare.156865)
- Machado, ,** Barbosa, VCF. Use of the “shape-of-anomaly” data misfit in 3D inversion by planting anomalous densities, *SEG Annual Meeting 2012*, Las Vegas, USA. doi:[10.1190/segam2012-0383.1](https://doi.org/10.1190/segam2012-0383.1).  
 • Slides:  [doi.org/10.6084/m9.figshare.156864](https://doi.org/10.6084/m9.figshare.156864)
- Machado, ,** Barbosa, VCF. Rapid 3D inversion of gravity and gravity gradient data to test geologic hypotheses, *International Symposium on Gravity, Geoid and Height Systems*, Venice, Italy.  
 • Slides:  [doi.org/10.6084/m9.figshare.156859](https://doi.org/10.6084/m9.figshare.156859)
- 2011 **Machado, ,** Barbosa, VCF. Robust 3D gravity gradient inversion by planting anomalous densities, *SEG Annual Meeting 2011*, San Antonio, USA. doi:[10.1190/1.3628201](https://doi.org/10.1190/1.3628201).  
 • Slides:  [doi.org/10.6084/m9.figshare.156863](https://doi.org/10.6084/m9.figshare.156863)
- Machado, ,** Barbosa, VCF. 3D gravity inversion by planting anomalous densities, *International Congress of the Brazilian Geophysical Society*, Rio de Janeiro, Brazil. doi:[10.1190/sbgf2011-179](https://doi.org/10.1190/sbgf2011-179).  
 • Slides:  [doi.org/10.6084/m9.figshare.156861](https://doi.org/10.6084/m9.figshare.156861)
- Machado, ,** Bomfim, EP, Braitenberg, C, Molina, E. Optimal forward calculation method of the Marussi tensor due to a geologic structure at GOCE height, *4th International GOCE User Workshop*, Munich, Germany.  
 • Poster:  [doi.org/10.6084/m9.figshare.92624](https://doi.org/10.6084/m9.figshare.92624)
- Machado, ,** Barbosa, VCF. 3D gravity gradient inversion by planting density anomalies, *73th EAGE Conference and Exhibition incorporating SPE EUROPEC*, Vienna, Austria. doi:[10.3997/2214-4609.20149567](https://doi.org/10.3997/2214-4609.20149567).  
 • Poster:  [doi.org/10.6084/m9.figshare.91511](https://doi.org/10.6084/m9.figshare.91511)
- 2010 **Machado, ,** Ussami, N, Braitenberg, C. Computation of the gravity gradient tensor due to topographic masses using tesseroids, *AGU Meeting of the Americas*, Foz do Iguaçu, Brazil.  
 • Slides:  [doi.org/10.6084/m9.figshare.156858](https://doi.org/10.6084/m9.figshare.156858)
- 2008 **Machado, ,** Ussami, N. Utilização de tesseróides na modelagem de dados de gradiometria gravimétrica, *XIII Simpósio de Iniciação Científica do IAG-USP*, São Paulo, Brazil.  
 • Poster:  [doi.org/10.6084/m9.figshare.4779760](https://doi.org/10.6084/m9.figshare.4779760)





- 2006 **Machado, ,** D’Agrella-Filho, MS. Paleomagnetismo e mineralogia magnética dos diques cambrianos de Maravilhas e Prata (PB), *XI Simpósio de Iniciação Científica do IAG/USP*, São Paulo, Brazil.
- Poster:  [doi.org/10.6084/m9.figshare.4779769](https://doi.org/10.6084/m9.figshare.4779769)

## OUTREACH

I maintain a blog about my research, geoscience, and programming at [leouieda.com/blog](https://leouieda.com/blog)

- 2018 Interviewed by the geoscience podcast *Don’t Panic Geocast*, episode 166 “You are headed to a warm and sunny place”: [dontpanicgeocast.com/?p=638](https://dontpanicgeocast.com/?p=638)
- 2017 Volunteer for the *Hour of Code* at Salt Lake Elementary School, Honolulu, USA.
- 2016 Interviewed by the geoscience podcast *Undersampled Radio*, episode “Open Sourcery”: [undersampledrad.io/home/2016/7/open-sourcery](https://undersampledrad.io/home/2016/7/open-sourcery)

Geophysical tutorials for the SEG publication *The Leading Edge*:

- 2017  **Machado, .** Step-by-step NMO correction, *The Leading Edge*, doi:[10.1190/tle36020179.1](https://doi.org/10.1190/tle36020179.1).
- Code:  [pinga-lab/nmo-tutorial](https://github.com/pinga-lab/nmo-tutorial)
- 2014  **Machado, ,** Oliveira Jr, VC, Barbosa, VCF. Geophysical tutorial: Euler deconvolution of potential-field data, *The Leading Edge*, doi:[10.1190/tle33040448.1](https://doi.org/10.1190/tle33040448.1).
- Code:  [pinga-lab/paper-tle-euler-tutorial](https://github.com/pinga-lab/paper-tle-euler-tutorial)

## ACADEMIC SERVICE & AFFILIATIONS

### EDITOR

2019 – present Topic editor for the *Journal of Open Source Software*

### COMMUNITY SERVICE

2019 – present EarthArXiv Advisory Council

### COMMITTEES

- 2020 – present Department committee for web presence (website, social media, etc), University of Liverpool.
- 2020 – present Earth Sciences representative at the Early Career Academic (ECA) forum, University of Liverpool.
- 2015 Chairman of the Election Committee for the deans of the University and the School of Geology, Universidade do Estado do Rio de Janeiro.
- 2015 – 2017 Faculty Advisor for the Student Chapter of the Society of Exploration Geophysicists (SEG) at the Universidade do Estado do Rio de Janeiro.

### CONFERENCE CONVENER

- 2021 Session: EOS5.3 - The evolving open-science landscape in geosciences: open data, software, publications and community initiatives.  
Nijzink, RC, Drost, N, Farquharson, J, Kushnir, A, Pianosi, F, Schymanski, S, **Machado**, , Wadsworth, F.  
*EGU 2021*, Vienna, Austria.
- Session: G4.3 - Acquisition and processing of gravity and magnetic field data and their integrative interpretation.  
Ebbing, J, Braitenberg, C, Guy, A, Kaban, MK, **Machado**, .  
*EGU 2021*, Vienna, Austria.
- 2019 Townhall: Update and Future Directions of the Open-Source Software Initiative.  
**Machado**, , Heagy, LJ, Krischer, L, Gassmoeller, R, Sullivan, CB.  
*AGU 2019*, San Francisco, USA.
- Session: NS21A - A Tour of Open-Source Software Packages for the Geosciences.  
Heagy, LJ, Gassmoeller, R, **Machado**, , Klump, JF.  
*AGU 2019*, San Francisco, USA.
- 2018 Townhall: The role of an open-source software initiative within the AGU.  
Heagy, LJ, Krischer, L, **Machado**, .  
*AGU 2018*, Washington DC, USA.

## REVIEWER

- Geophysical Journal International
- Journal of Geodesy
- Pure and Applied Geophysics
- Journal of Applied Geophysics
- Geophysical Prospecting
- Geophysics
- Central European Journal of Geosciences
- Computers & Geosciences
- Journal of Open Source Software

## AFFILIATIONS

- 2020 – present Royal Astronomical Society
- 2014 – present [Software Underground](#)
- 2014 – present European Geosciences Union
- 2010 – present American Geophysical Union
- 2011 – 2019 Society of Exploration Geophysicists

## LANGUAGES

- Portuguese Native
- English IELTS: CEFR Level C2 (mastery or proficiency) obtained in 2019