Leonardo Uieda

Curriculum Vitæ — October, 2018

Department of Earth Sciences – SOEST – University of Hawai'i at Mānoa
POST Building Suite 821, 1680 East-West Rd, Honolulu, HI, USA, 96822
ORCID: 0000-0001-6123-9515 — leouieda@gmail.com — www.leouieda.com

PROFESSIONAL APPOINTMENTS

2017– **Visiting Research Scholar**, Department of Earth Sciences, School of Ocean and Earth Science and Technology, University of Hawai'i at Mānoa, USA

2014–2018 **Assistant Professor**, Departamento de Geologia Aplicada, Faculdade de Geologia, Universidade do Estado do Rio de Janeiro, Brazil

EDUCATION

2016 **PhD in Geophysics**, Observatrio Nacional, Brazil
Thesis: Forward modeling and inversion of gravitational fields in spherical coordinates

2011 **MSc in Geophysics**, Observatrio Nacional, Brazil

2009 **BSc in Geophysics**, Universidade de So Paulo, Brazil

2008 **International Exchange**, York University, Canada

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

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

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 Antornio, 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 So Paulo Research Foundation (FAPESP) **Undergraduate Research Scholarship**

GRANTS & FELLOWSHIPS

2018–2020 NSF-EAR: "The EarthScope/GMT Analysis and Visualization Toolbox". PI: Wessel, P, **co-PI**: **Uieda, L**, co-PI: Smith-Konter, B. University of Hawai'i at Mānoa. Award number: 1829371. $174,975.

PUBLICATIONS

Source code, data, and PDFs for most articles are available at leouieda.com/papers

PEER-REVIEWED

in review Soler, SR, Pesce, A, **Uieda, L**, Gimenez, ME. Gravitational field calculation in spherical coordinates using variable densities in depth. In review at *Geophysical Journal International*.

Zhao, G, Chen, B, **Uieda, L**, Liu, J, Chen, L, Guo, R. Efficient 3D large-scale forward-modeling and inversion of gravitational fields in spherical coordinates with application to lunar mascons. In review at *JGR Solid Earth*.

Oliveira Jr, VC, **Uieda, L**, Hallam, KAT, Barbosa, VCF. Should geophysicists use the gravity disturbance or the anomaly? In review at *Geophysics*. Preprint: leouieda.com/papers/use-the-disturbance.html

2018 **Uieda, L**. Verde: Processing and gridding spatial data using Green's functions. *Journal of Open Source Software*. doi:10.21105/joss.00957.

2017 **Uieda, L**, 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.

2016 **Uieda, L**, Barbosa, VCF, Braitenberg, C. Tesseroids: forward modeling gravitational fields in spherical coordinates, *Geophysics*, doi:10.1190/geo2015-0204.1.

Carlos, DU, **Uieda, L**, Barbosa, VCF. How two gravity-gradient inversion methods can be used to reveal different geologic features of ore deposit - A case study from the Quadriltero Ferrfero (Brazil), *Journal of Applied Geophysics*, doi:10.1016/j.jappgeo.2016.04.011.

2015 Oliveira Jr, VC, Sales, DP, Barbosa, VCF, **Uieda, L**. Estimation of the total magnetization direction of approximately spherical bodies, *Nonlinear Processes in Geophysics*, doi:10.5194/npg-22-215-2015.

2014 Carlos, DU, **Uieda, L**, Barbosa, VCF. Imaging iron ore from the Quadriltero Ferrfero (Brazil) using geophysical inversion and drill hole data, *Ore Geology Reviews*, doi:10.1016/j.oregeorev.2014.02.011.

2013 Melo, FF, Barbosa, VCF, **Uieda, L**, 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.

Oliveira Jr, VC, Barbosa, VCF, **Uieda, L**. Polynomial equivalent layer, *Geophysics*, doi:10.1190/geo2012-0196.1.

2012 **Uieda, L**, Barbosa, VCF. Robust 3D gravity gradient inversion by planting anomalous densities, *Geophysics*, doi:10.1190/geo2011-0388.1.

PEER-REVIEWED CONFERENCE PROCEEDINGS

2014 Melo, FF, Barbosa, VCF, **Uieda, L**, Oliveira Jr, VC, Silva, JBC. A Single Euler Solution Per Anomaly, *76th EAGE Conference and Exhibition 2014*, doi:10.3997/2214-4609.20140891.

2013 **Uieda, L**, Oliveira Jr, VC, Barbosa, VCF. Modeling the Earth with Fatiando a Terra, *Proceedings of the 12th Python in Science Conference*.

2012 **Uieda, L**, 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.

Carlos, DU, **Uieda, L**, Li, Y, Barbosa, VCF, Braga, MA, Angeli, G, Peres, G. Iron ore interpretation using gravity-gradient inversions in the Carajs, Brazil. *SEG Technical Program Expanded Abstracts*, doi:10.1190/segam2012-0525.1.

2011 **Uieda, L**, 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*.

Uieda, L, Barbosa, VCF. Robust 3D gravity gradient inversion by planting anomalous densities, *SEG Technical Program Expanded Abstracts*, doi:10.1190/1.3628201.

Uieda, L, Barbosa, VCF. 3D gravity inversion by planting anomalous densities. *12th International Congress of the Brazilian Geophysical Society*, doi:10.1190/sbgf2011-179.

Uieda, L, Barbosa, VCF. 3D gravity gradient inversion by planting density anomalies. *73th EAGE Conference and Exhibition incorporating SPE EUROPEC*, doi:10.3997/2214-4609.20149567.

Carlos, DU, **Uieda, L**, Barbosa, VCF, Braga, MA, Gomes, AAS. In-depth imaging of an iron orebody from Quadrilatero Ferrifero using 3D gravity gradient inversion, *SEG Technical Program Expanded Abstracts*, doi:10.1190/1.3628219.

Carlos, DU, Barbosa, VCF, **Uieda, L**, Braga, MA. Inverso de Dados de Aerogradiometria Gravimtrica 3D-FTG Aplicada a Explorao Mineral na Regio do Quadriltero Ferrfero, *12th International Congress of the Brazilian Geophysical Society*, doi:10.1190/sbgf2011-243.

OTHER PUBLICATIONS

2017 **Uieda, L**. Step-by-step NMO correction, *The Leading Edge*, doi:10.1190/tle36020179.1.

2014 **Uieda, L**, Oliveira Jr, VC, Barbosa, VCF. Geophysical tutorial: Euler deconvolution of potential-field data, *The Leading Edge*, doi:10.1190/tle33040448.1.

OPEN DATASETS

2017 **Uieda, L**, 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

OPEN-SOURCE SOFTWARE

I work on several open-source projects, all of which are available through my Github profile github.com/leouieda.

2017– **GMT/Python** – www.gmtpython.xyz – A Python interface for the Generic Mapping Tools.

2010– **Fatiando a Terra** – www.fatiando.org – Toolkit for geophysical data analysis, forward modeling, and inversion. Language: Python.

2009–2016 **Tesseroids** – www.tesseroids.org – Forward modeling of gravitational fields in spherical coordinates. Language: C.

TEACHING

All educational material developed for these courses is available at leouieda.com/teaching

UNDERGRADUATE – UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO

2014–2016 Special Mathematics I: Introduction to Programming and Numerical Analysis

2014–2016 Geophysics I: Gravity and magnetic methods

2014–2016 Geophysics II: Exploration Seismology

2015 Introduction to Geology

WORKSHOPS AND SHORT COURSES

future Best Practices for Modern Open-Source Research Codes (half day workshop)
AGU 2018, Washington DC, USA.

2017 Introduction to Python (6 hour workshop)
Department of Geology and Geophysics – University of Hawai'i at Mānoa, USA

2016 Python for Geologists (6 hour workshop)
School of Geology – Universidade do Estado do Rio de Janeiro, Brazil

Python for Earth Scientists (30 hour short course)
Department of Geophysics – Universidade de So Paulo, Brazil

2014 Introduction to Geophysical Inversion (16 hour short course)
Institute of Geosciences – Universidade de Braslia, Brazil

2011 Introduction to Geophysical Inversion (30 hour short course)
Department of Geophysics – Universidade de So Paulo, Brazil

PRESENTATIONS

Slides, posters, and abstracts for all presentations are available at leouieda.com/talks and leouieda.com/posters

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

2018 **Uieda, L**. Machine Learning Lessons for Geophysics, *Department of Earth Sciences, University of Hawai'i at Mānoa*, Honolulu, USA.

Uieda, L, Wessel, P. Building an object-oriented Python interface for the Generic Mapping Tools, *Scipy 2018*, Austin, USA. [recording: youtu.be/6wMtfZXfTRM]

Uieda, L, Sandwell, DT, Wessel, P. Joint Interpolation of 3-component GPS Velocities Constrained by Elasticity, *AOGS* 15^{th} *Annual Meeting*, Honolulu, USA.

Uieda, L, Wessel, P. Integrating the Generic Mapping Tools with the Scientific Python Ecosystem, *AOGS* 15^{th} *Annual Meeting*, Honolulu, USA.

2017 [**Invited**] – **Uieda, L**, Wessel, P. Nurturing reliable and robust open-source scientific software, *AGU Fall Meeting 2017*, New Orleans, USA. [recording: youtu.be/0GO4ZZ5Ry6M]

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

Uieda, L, Wessel, P. Bringing the Generic Mapping Tools to Python, *Scipy 2017*, Austin, USA. [recording: youtu.be/93M4How7R24]

Uieda, L. 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.

2016 [**Invited**] – **Uieda, L**. Fatiando a Terra: construindo uma base para ensino e pesquisa de geofsica, *Observatrio Nacional*, Rio de Janeiro, Brazil.

2015 [**Invited**] – **Uieda, L**. Fatiando a Terra: construindo uma base para ensino e pesquisa de geofsica, *Universidade de So Paulo*, So Paulo, Brazil.

2014 **Uieda, L**, et al. Using Fatiando a Terra to solve inverse problems in geophysics, *Scipy 2014*, Austin, USA.

Uieda, L, et al. Gravity inversion in spherical coordinates using tesseroids, *EGU General Assembly 2014*, Vienna, Austria.

2013 **Uieda, L**, et al. Modeling the Earth with Fatiando a Terra, *Scipy 2013*, Austin, USA. [recording: youtu.be/Ec38h1oB8cc]

Uieda, L, et al. 3D magnetic inversion by planting anomalous densities, *AGU Meeting of the Americas*, Cancun, Mexico.

2012 Carlos, DU, **Uieda, L**, et al. Iron ore interpretation using gravity-gradient inversions in the Carajs, Brazil, *SEG Annual Meeting 2012*, Las Vegas, USA.

Uieda, L, et al. Use of the "shape-of-anomaly" data misfit in 3D inversion by planting anomalous densities, *SEG Annual Meeting 2012*, Las Vegas, USA.

Uieda, L, et al. Rapid 3D inversion of gravity and gravity gradient data to test geologic hypotheses, *International Symposium on Gravity, Geoid and Height Systems*, Venice, Italy.

2011 **Uieda, L**, et al. Robust 3D gravity gradient inversion by planting anomalous densities, *SEG Annual Meeting 2011*, San Antonio, USA.

Uieda, L, et al. 3D gravity inversion by planting anomalous densities, *Internation Congress of the Brazilian Geophysical Society*, Rio de Janeiro, Brazil.

Uieda, L, et al. Optimal forward calculation method of the Marussi tensor due to a geologic structure at GOCE height, *4th International GOCE User Workshop*, Munich, Germany.

Uieda, L, et al. 3D gravity gradient inversion by planting density anomalies, *73th EAGE Conference and Exhibition incorporating SPE EUROPEC*, Vienna, Austria.

2010 **Uieda, L**, et al. Computation of the gravity gradient tensor due to topographic masses using tesseroids, *AGU Meeting of the Americas*, Foz do Iguau, Brazil.

2008 **Uieda, L**, et al. Utilizao de tesserides na modelagem de dados de gradiometria gravimtrica, *XIII Simpsio de Iniciao Cientfica do IAG-USP*, So Paulo, Brazil.

2006 **Uieda, L**, et al. Paleomagnetismo e mineralogia magntica dos diques cambrianos de Maravilhas e Prata (PB), *XI Simpsio de Iniciao Cientfica do IAG/USP*, So Paulo, Brazil.

ACADEMIC SERVICE & AFFILIATIONS

COMMITTEES

2015 Chairman of the Election Committee for the deans of the University and the School of Geology, Universidade do Estado do Rio de Janeiro

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

American Geophysical Union – Society of Exploration Geophysicists – Geological Society of America

LANGUAGES

Portuguese	Native
English	Fluent (TOEFL iBT score 115/120)