

Miguel Neves

Postdoctoral Researcher - Seismology
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RESEARCH INTERESTS

Data mining and machine learning applications in seismology; Complex earthquake sequences; External stressors and seismicity; Slowly deforming regions.

EDUCATION

PhD Geophysics <i>School of Earth and Atmospheric Sciences, Georgia Institute of Technology</i> Minor in Higher Education Advisor: Dr. Zhigang Peng	2017–2023
MSc Geophysical Sciences <i>Faculty of Sciences, University of Lisbon</i> Concentration in Solid Earth Master Thesis: <i>Dynamic triggering of seismic activity in rifting and volcanic settings</i> Advisor: Dr. Susana Custódio	2014–2016
BSc Engineering Physics <i>Instituto Superior Técnico, University of Lisbon</i>	2010–2014

EXPERIENCE

Teaching Assistant <i>School of Earth and Atmospheric Sciences, Georgia Institute of Technology</i> Courses: 'EAS2600: Earth Processes' (Fall 2018 and Spring 2020) Courses: 'EAS1601: Habitable Planet' (Spring 2018)	Fall 2018, Spring 2018 and 2020 Atlanta, GA
Research Trainee <i>Instituto Dom Luiz, University of Lisbon</i> Member of Project FIRE. Research on the 2014 Fogo Island eruption, Cape Verde, using seismic ambient noise monitoring techniques. Advisor: Dr. Graça Silveira	March–August 2017 Lisbon, Portugal

PEER-REVIEWED PUBLICATIONS

G. Lin, Z. Peng and **M. Neves** (2022), *Comparisons of in situ V_p/V_s ratios and seismic characteristics between northern and southern California*. *Geophysical Journal International*, 229(3), 2162–2174, doi: 10.1093/gji/ggac038.

M. Neves, S. Custódio, Z. Peng and A. Ayorinde (2018), *Earthquake triggering in southeast Africa following the 2012 Indian Ocean earthquake*. *Geophysical Journal International*, 212(2), 1331–1343, doi: 10.1093/gji/ggx462.

M. Neves, Z. Peng and G. Lin (*in review*), *A High-Resolution Earthquake Catalog for the 2004 M6 Parkfield Earthquake Sequence using a Matched Filter Technique*.

M. Neves, L. Chuang, W. Li, Z. Peng and S. Ni (*in prep.*), *Combining Deep Learning and Matched Filter Detection to image a Complex Earthquake Sequence in Sparta, North Carolina, Eastern United States*.

M. Neves, Z. Peng, S. Custódio, M. Maceira and C. Chai (*in prep.*), *New Perspective on Iberia's Seismicity using Dense Seismic Deployments and Deep Learning*.

GENERAL AUDIENCE PUBLICATIONS

M. Neves (2020), *Earthquakes in Turkey support two disparate models of earthquake initiation*. Temblor, <http://doi.org/10.32858/temblor.133>.

M. Neves (2020), *Challenges of earthquake early warning*. Temblor, <http://doi.org/10.32858/temblor.093>.

ABSTRACTS

Z. Peng, M. Neves, C. Daniels, Q. Zhai and S. Jaumé, *Systematic Detection of Microearthquakes During Several Moderate-Size Earthquake Sequences in Central and Eastern United States*, 2022 SAGE/GAGE Community Workshop, Pittsburgh, PA, USA, June 2022 (Poster presentation).

M. Neves, Z. Peng, S. Custódio, M. Maceira and C. Chai, *Illuminating Seismic Structures in Iberia Using a Deep Learning Seismic Phase Detector*, 54th AGU Fall Meeting, Abstract #T55D-0105, New Orleans, LA, USA, December 2021 (Poster presentation).

M. Neves, Z. Peng, G. Lin and C. Daniels, *Detailed Study of the 2004 Mw 6 Parkfield Earthquake Sequence Using a New Relocated Microearthquake Catalog*, 54th AGU Fall Meeting, Abstract #S45F-0361, New Orleans, LA, USA, December 2021 (Poster presentation).

M. Neves, L. Chuang, W. Li, Z. Peng and S. Ni, *Seismological studies of the 2020 M5.1 Sparta Earthquake sequence, North Carolina*, 2021 Eastern Section SSA Annual Meeting, Virtual, October 2021 (Oral presentation).

M. Neves, Z. Peng, S. Custódio, C. Chai and M. Maceira *Earthquake detection in Iberia based on dense seismic deployments using deep learning and matched filter techniques*, 37th General Assembly of European Seismological Commission, Virtual, September 2021 (Oral presentation).

M. Neves, Z. Peng, and G. Lin, *New Microearthquake Catalog for the Parkfield Section of the San Andreas Fault, California*, 2021 SSA Annual Meeting, Virtual, April 2021 (Poster presentation).

M. Neves, Z. Peng, and S. Custódio, *Earthquake Detection in Iberia using a Deep Convolutional Neural Network Phase Picker*, 52nd AGU Fall Meeting, Virtual, December 2020 (Poster presentation).

M. Neves, Z. Peng, and S. Custódio, *Seismicity Detection at the Slowly Deforming Iberia using Deep Learning*, 2020 Eastern Section SSA Annual Meeting, Virtual, October 2020 (Oral presentation).

L. Chuang, M. Neves and Z. Peng, *Foreshock and aftershocks sequence of the M5.1 Sparta Earthquake in North Carolina*, 2020 Eastern Section SSA Annual Meeting, Virtual, October 2020.

M. Neves, Z. Peng, G. Lin and C. Daniels, *Study of the Parkfield section of the San Andreas Fault, California, using a new microearthquake catalog*, 52nd AGU Fall Meeting, Abstract #S53E-0496, San Francisco, CA, USA, December 2019 (Poster presentation).

Z. Peng, M. Neves, C. Daniels, L. Zhu, J. McLellan and J. Zhuang, *Seismic Detection of Very Early Aftershocks Following the 2004 M6.0 Parkfield Earthquake*, 51st AGU Fall Meeting, Abstract #S11C-0373, Washington D.C., USA, December 2018 (Poster presentation).

M. Neves, Z. Peng and S. Custódio, *Remote dynamic triggering in southeast Africa*, Seismology of the Americas, joint LASC and SSA meeting, Miami, FL, USA, May 2018 (Oral presentation).

M. Neves, Z. Peng, X. Meng, C. Daniels and G. Lin, *Systematic detections of microearthquakes and repeaters in Parkfield long before and after the 2004 M6 Earthquake*, Seismology of the Americas, joint LASC and SSA meeting, Miami, FL, USA, May 2018 (Poster presentation).

M. Neves, S. Custódio and Z. Peng, *Dynamic earthquake triggering in southeast Africa*, EGU General Assembly, Abstract EGU2018-16344, Vienna, Austria, April 2018 (Poster presentation).

AWARDS

FCT Doctoral Fellowship <i>Fundação para Ciência e Tecnologia (Portuguese NSF)</i>	2019 – 2022
Georgia Tech-Oak Ridge National Lab Seed Grants <i>Georgia Institute of Technology</i>	2021
Graduate Student Symposium Best Poster Award <i>School of Earth and Atmospheric Sciences, Georgia Institute of Technology</i>	2019, 2018

TRAINING

Short course <i>2nd TIDES Training School</i>	September 2016 <i>Sesimbra, Portugal</i>
Short course <i>TIDES (MS)Noise Workshop Vienna</i>	April 2016 <i>Vienna, Austria</i>

COMPUTATIONAL SKILLS

Programming Languages: Proficient with Python, C/C++, Julia. Basic knowledge of Matlab and Fortran.

Software Libraries: Proficient with ObsPy, NumPy, SciPy, GMT, SAC, Latex. Working knowledge of Machine Learning libraries: Tensorflow, Keras, PyTorch, Scikit-Learn. Working knowledge of parallel programming libraries: CUDA, OpenMP.

Operating Systems: Proficient with Linux, MacOS, Windows.

SERVICE AND OUTREACH

Vice President, Graduates in Earth and Atmospheric Sciences Council <i>Georgia Institute of Technology</i>	2019 – 2021 <i>Atlanta, GA</i>
EAS Graduate Student Symposium <i>Georgia Institute of Technology</i> Organizing committee and oral session moderator.	Spring 2021 <i>Atlanta, GA</i>
Geophysics Seminar Coordinator <i>School of Earth and Atmospheric Sciences, Georgia Institute of Technology</i> Invite and schedule seminar speakers. Maintain website and divulge talks.	Fall 2018 - Spring 2020 <i>Atlanta, GA</i>
Volunteer <i>Atlanta Science Festival, EAS Halloween Open House, Ponce Science Showcase series Atlanta, GA</i> Showcasing different activities to explain earthquake science and atmospheric sciences.	2018
Volunteer <i>IDL Outreach activities</i> Different activities for the general public in the street and in museums. Small hands-on experiments to explain seismic and tsunami hazard, earthquake preparedness, and how seismologists study earthquakes and the deep Earth.	2015-2017 <i>Lisbon area, Portugal</i>
Scout Leader <i>Corpo Nacional de Escutas</i>	2014-2017 <i>Lisbon, Portugal</i>

Two years in training with the 10-14 years old section. One year responsible for the 14-18 years old section.

Devise and plan opportunities for young people in personal development, volunteering actions and outdoor activities.

LANGUAGES

English: Proficient

Portuguese: Native

German: Basic conversation/writing

French: Basic conversation/writing

Spanish: Basic conversation/writing

PROFESSIONAL ORGANIZATIONS

- American Geophysical Union (*AGU*)
- European Geosciences Union (*EGU*)
- Seismological Society of America (*SSA*)

REFERENCES

- Professor Zhigang Peng (*PhD advisor*): zpeng@gatech.edu
- Professor Susana Custódio (*MSc advisor*): sicustodio@fc.ul.pt
- Professor Graça Silveira: mdsilveira@fc.ul.pt