

# Agustina Pesce

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## Professional Experience

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### Coding Coordinator and Trainer

Nov 2021 – on

#### [Code to Communicate Program](#)

A NSF-funded bilingual coding and science communication training program for early career geoscientists.

- **Collaborated** in multiple tasks including **curriculum development**, **people management** and updating file records to establish a strong foundation for the 10-week program focused on teaching Python and science communication, as well as a 1-week hackathon where participants developed a shared project.
- **Led** and **supervised** a team of 5+ trainers to teach coding skills to 20 students, who proved good coding proficiency and communication skills by the end of the program.
- **Created** and **maintained** a [GitHub repository](#) containing the course material: [Jupyter](#) Notebooks used to teach during each lesson. This ensured that the course materials were up-to-date and easily accessible for future students.

### Postdoctoral Researcher

Apr 2019 – Mar 2022

Instituto Geofísico Sismológico Volponi, Argentina

Project title: *Influence of a mantle plume in subduction zones by geodynamics numerical models.*

- **Acquired** the knowledge to operate [Mandyoc](#), a software for running geodynamical numerical simulations of the Earth's interior.
- **Developed** a Bash pipeline that enables the creation of subduction models for [Mandyoc](#), facilitates the remote execution of simulation on [Google Cloud Platform](#), and allows for easy download of the outputs.
- **Built** [tapioca](#), a Python package to transform and visualize the outputs of [Mandyoc](#) using [Xarray](#) and [Matplotlib](#).
- **Gave** an [online seminar](#) to instruct lab members on the handling of multidimensional arrays with [Xarray](#).
- **Presented project results** in [international scientific meetings](#), demonstrating my ability to effectively communicate technical information to a wide audience.

### Assistant Professor of Practice

Oct 2019 – Mar 2022

Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de San Juan, Argentina

- **Led** the practice and lab classes of Physics courses for 30+ Geology students.
- **Evaluated** students' performance through quizzes, exams and laboratory practices.
- **Collaborated** in the lesson preparation and **participated** in Physics Lectures.
- **Set up** and **maintained** online classroom during the pandemic and **instructed** other Professors on how to take advantage of its tools.

### PhD Researcher

Apr 2014 – Mar 2019

Instituto Geofísico Sismológico Volponi, Argentina

Thesis title: *Geophysical analysis of the Loncopué Trough, Neuquén, Argentina*

- **Developed** and **further explored** a project throughout a 5-year PhD which was **funded** by the Consejo Nacional de Investigaciones Científicas y Técnicas.
- **Compiled** and **preprocessed** gravity and magnetic datasets from different sources (ground and satellite) using specialized software and Python libraries like **NumPy**, **Pandas**, **Xarray** and **Fatiando a Terra**.
- **Applied geophysical processing steps** to produce interpretable maps of the study area using **Matplotlib** and **PyGMT**.
- **Inverted** the gravity data to get better understanding of the underlying structures and bodies beneath the Earth's surface using **Fatiando a Terra** tools.
- **Published research results** in peer-reviewed scientific journals and **contributed** in the writing of book chapters.
- **Presented** my research in international scientific meetings.
- **Assisted my peers** to improve their research, achieving higher quality scientific publications.

## Projects

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### Maintainer of collaborative Python lesson

Jun 2022 – On

#### The Carpentries

- **Assigned** the role of maintainer of **Análisis y visualización de datos usando Python**, one of the core lessons of **The Carpentries**.
- **Participated** in maintainers' meetings discussing how to improve the current version of the lesson.
- **Contributed** to the improvement of **Control de versiones con Git** reviewing GitHub Pull Requests.

### Diabetes predictor

2023

The project goal is to create a model to predict the probability of diabetes in patients.

- **Utilized** **Pandas** and **seaborn** to explore and visualize the data in a **Jupyter** Notebook.
- **Created a code** to test 3 different classification algorithms, including logistic regression and decision trees, to generate a prediction model using the **scikit-learn** tools.

### Journal manager

2022

A custom command-line tool developed using Python to manage and organize my weekly tasks and activity logs across multiple projects.

- **Designed** and **implemented** the code using **Click**.
- **Wrote** a Makefile to simplify the installation process.

### COVID-19 dashboard

2020

Visualization of the evolution of COVID-19 on each province of Argentina

- **Loaded, cleaned** and **processed** the data using **Pandas**.
- Utilized **Plotly** and **Dash** to **create interactive plots** that allowed users to easily track and analyze the spread of the virus across different regions in Argentina.

### Mandyoc collaborator

Apr 2019 – Mar 2022

Open source tool to simulate the mantle dynamics

- **Automated the deployment** of the documentation website using GitHub Actions, ensuring that users can easily access up-to-date documentation.
- **Designed** and **coded tests** to check the correct performing of the code using **Pytest**.
- **Worked on community building** adding license, code of conduct, how to contribute guidelines and Readme to improve the repository.

- **Restructured** the examples gallery using [Jupyter](#) Notebooks to show how to use the code with real examples.
- **Developed** a Makefile for building and installing the program.
- **Collaborate** in the publication of [Mandyoc](#) code in the [Journal of Open Source Software](#).

## Fatiando a Terra collaborator

2016 – On

Open source tools for geophysics

- **Implemented new features** with unit tests using [Pytest](#), documentation and an example of how to use it.
- **Improved** the main website project by updating content and optimizing performance.
- **Created new examples notebooks** explaining how to use the library.
- **Made maintenance tasks** to fix CI, code automated tasks and delete deprecated code.
- **Participated** in developers and community meetings to discuss how to improve the current tools, cultivate the community, design examples, etc.

## Website developer

2021

- **Designed and implemented** responsive website layouts using HTML, CSS for different projects:
  - [Diana Acero personal website](#).
  - [Geolatinas coding group: organization website](#)
  - [CromoGráfica: business website currently under development](#).
- **Created a clean code** for all projects and **deployed** it using GitHub Actions and GitHub Pages.
- **Maintained and updated** websites based on feedback from stakeholders and users.

## Education

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2014 – 2019	<b>PhD in Geophysics</b> , Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de San Juan, Argentina
2005 – 2014	<b>Licentiate in Physics</b> , Facultad de Ciencias Exactas, Ingeniería y Agrimensura, Universidad Nacional de Rosario, Argentina

## Certifications

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2022	Data Science Bootcamp Online from <a href="#">Código Facilito</a>
2022	Database course from <a href="#">Código Facilito</a>
2021	Certified Software Carpentry Instructor

## Technical Skills

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<b>Programming</b>	Python ( <a href="#">NumPy</a> , <a href="#">Pandas</a> , <a href="#">SciPy</a> , <a href="#">Xarray</a> , <a href="#">scikit-learn</a> , <a href="#">Matplotlib</a> , <a href="#">Plotly</a> , <a href="#">Dash</a> , <a href="#">PyGMT</a> , <a href="#">seaborn</a> ), bash, FORTRAN, C, SQL
<b>Markup</b>	Markdown, LaTeX, HTML
<b>WebDev</b>	CSS, Bootstrap, Normalize, Static Site Generators ( <a href="#">jekyll</a> , <a href="#">urubu</a> )

<b>DevOps</b>	GNU/Linux, Unix terminal, VIM, Neovim, VS Code, git, GNU Make, SSH, <a href="#">setuptools</a>
<b>Office</b>	LibreOffice Suite, Microsoft Office
<b>Other tools</b>	Jupyter notebooks, JupyterLab, GitHub Actions, Maxima, Inkscape, GIMP, Krita, Docker, Google Cloud Platform, Google Workspace and Google Drive,

## Languages

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<b>Spanish</b>	Native
<b>English</b>	Advanced

## Service Work

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### Part of Steering Council in [Fatiando a Terra](#)

I help plan, organize, and direct the project's operations and programs.

### Part of Steering Council in [Open Science Labs](#)

I help promote a friendly virtual space for learning open-source tools for people in Latin America.

### Volunteers in [PyCascade 2023](#)

I collaborated at the Check-in Desk/Registration.

### Member of [pyOpenSci](#) community

I have contributed by conducting a peer review for Xclim. Additionally, I am helping to create a mentorship program aimed at engaging individuals from diverse backgrounds and identities in all aspects of the peer review process.

### Member of International [GeoLatinas](#) community

I support the community by giving Python and Git courses, developing the coding group website, and mentoring other members on programming.

### Member of [The Carpentries](#) community

I contribute to the community as a lesson maintainer and instructor.

### Technical advisor in [Climatematch Academy](#).

I am collaborating in the creation of the infrastructure to develop the lessons, build the website and solve technical issues.

## Awards and Scholarships

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2019 – 2022	Postdoctoral Scholarship from Consejo Nacional de Investigaciones Científicas y Técnicas
2014 – 2019	PhD scholarship from Consejo Nacional de Investigaciones Científicas y Técnicas
2015	Travel grants: SEG/ExxonMobil Student Education Program (SEP), New Orleans, USA

## Highlight Publications

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Peer-reviewed papers

- 2022 [Mandyoc: A finite element code to simulate thermochemical convection in parallel](#), *Journal of Open-Source Software*, 7(71). 4070.
- 2021 [Sección eléctrica cortical a través de la fosa de Loncopué](#), *Revista de la Asociación Geológica Argentina* 78 (2), 333–337.
- 2020 [Oligocene to present shallow subduction beneath the southern](#), *Tectonophysics*.

#### Books Chapters

- 2020 [Pliocene to Quaternary Retroarc Extension in the Neuquén Basin: Geophysical Characterization of the Loncopué Trough](#), *Opening and closure of the Neuquén Basin in the Southern Andes*, Springer
- 2020 [Plume Subduction Beneath the Neuquén Basin and the Last Mountain Building Stage of the Southern Central Andes](#), *Opening and closure of the Neuquén Basin in the Southern Andes*, Springer

## Highlight Talks

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- 2022 [Mandyoc: A finite element code to simulate thermochemical convection in parallel](#), presented at *Transform 2022*.
- 2021 [Introduction to Git and GitHub](#), for *GeoLatinas*.
- 2021 [Fatiando a Terra: Open-source tools for geophysics](#), Online talk given to the *Geophysical Society of Houston (GSH)*.
- 2021 [Harmonica and Boule: Modern Python tools for geophysical gravimetry](#), *EGU2021 General Assembly*.
- 2020 [Evaluation of the presence of a weak layer in the numerical simulation of lithospheric subduction](#), *EGU2020 General Assembly*.