

# Agustina Pesce Lopez

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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 different tasks such as **curriculum development**, **people management** and updating file records to create a good foundation for the 10-week program to teach Python and science communication.
- **Led** and **supervised** a team of 5+ trainers to teach how to code to 20 students, who proved good coding proficiency and communication skills by the end of the program.
- **Organized** and **supervised** a 1-week hackathon where participants developed a shared project using version control system and Jupyter notebooks, and communicated the achieved goals and results through public presentations.
- **Created** and **maintained** a [GitHub repository](#) with the course material: [Jupyter](#) Notebooks used to teach during each lesson.
- **Reported** the progress of the project to superior managers and external evaluators.

### 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 to create subduction models as inputs for [Mandyoc](#), run the simulations remotely on [Google Cloud Platform](#) and download 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 how to handle multidimensional arrays with [Xarray](#).
- **Presented** project results in [international scientific meetings](#).

### 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.
- **Inverted** the gravity data to get better understanding of the underlying structures and bodies beneath the Earth's surface.
- **Published** research results in peer-reviewed scientific journals and **participated** in the writing of book chapters.
- **Presented** my research in international scientific meetings.
- **Organized, designed** and **took part** of field trips to perform data acquisition according to the needs of our team.
- **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

- **Got 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](#) lesson through reviewed GitHub Pull Requests.

### Diabetes predictor

2023

The project goal is to obtain a model that predicts the probability of diabetes in a patient based on different clinical symptoms.

- **Created** a Jupyter notebook to **explore and visualize the data** using [Pandas](#) and [seaborn](#) where the missing values were replaced and the relationship between diabetes and the different clinical symptoms was analyzed.
- **Wrote** a Jupyter notebook to **tests 3 classification algorithms** to generate a prediction model using the [scikit-learn](#) tools.

### Journal manager (Work in progress)

2022

It is a command-line program developed using Python to help me to organize my week's tasks and have a log file with my activities in different projects.

- **Designed** and **implemented** the code using [Click](#).
- **Wrote** a Makefile to install the journal manager as a console script using [setuptools](#).

### COVID-19 dashboard

2020

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

- **Loaded, cleaned** and **processed** the data using [Pandas](#).
- **Created interactive plots** showing the evolution of cases for each province using [Plotly](#) and [Dash](#).
- **Developed** an interactive web application and **deployed** it on [Heroku](#).

### Mandyoc collaborator

Apr 2019 – On

Open source tool to simulate the mantle dynamics

- **Automated deployment** of the documentation website through GitHub Actions.
- **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.
- **Created new examples notebook** 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

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

## Education

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Oct 2022 – Jan 2023	<b>Data Science Bootcamp Online</b> , from <a href="#">Código Facilito</a>
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	Database course from <a href="#">Código Facilito</a>
2022	Maintainer for The Carpentry
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="#">Matplotlib</a> , <a href="#">Plotly</a> , <a href="#">Dash</a> , <a href="#">PyGMT</a> ), bash, FORTRAN, C, SQL
<b>Markup</b>	Markdown, LaTeX, HTML
<b>WebDev</b>	CSS, Bootstrap, Normalize, Static Site Generators (jekyll, urubu)
<b>DevOps</b>	GNU/Linux, Unix terminal, VIM, Neovim, VS Code, git, GNU Make, SSH
<b>Office</b>	Libre Office Suite, Microsoft Office

**Other tools** Jupyter notebooks, JupyterLab, GitHub Actions, maxima, Inkscape, GIMP, Krita, Docker, Google Cloud Platform

## Languages

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**Spanish** Native  
**English** Advanced

## Service Work

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### Member of International **GeoLatinas** community

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

Contribute to the community as a lesson maintainer and instructor.

### Technical advisor in **Climatematch Academy**.

Collaborate in the creation of the infrastructure to develop the lessons, make 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 Puna plateau**, *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	<a href="#">Mandyoc: A finite element code to simulate thermochemical convection in parallel</a> , <i>presented at Transform 2022</i> .
2021	<a href="#">Introduction to Git and GitHub</a> , <i>for GeoLatinas</i> .
2021	<a href="#">Fatiando a Terra: Open-source tools for geophysics</a> , <i>Online talk given to the Geophysical Society of Houston (GSH)</i> .
2021	<a href="#">Harmonica and Boule: Modern Python tools for geophysical gravimetry</a> , <i>EGU2021 General Assembly</i> .
2020	<a href="#">Evaluation of the presence of a weak layer in the numerical simulation of lithospheric subduction</a> , <i>EGU2020 General Assembly</i> .