



Computational Geosciences

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Welcome to the Computational Geosciences resource

Welcome to the Computational Geosciences resource at the University of Stavanger (UiS), Norway. This is an educational project funded by the Faculty of Science and Technology at UiS. The resource is made by students and faculty from the departments of Energy Resources (IER) and Mechanical and Structural Engineering (IMBM).

Students: Angela Hoch (IER), Adham Amer (IMBM), Vania Mansoor and Linda Olsen (IER).

Postdocs: David Oakley (IER)

Faculty (UiS): Nestor Cardozo (IER), Lisa Watson (IER), Wiktor Weibull (IER), and Knut Giljarhus (IMBM).

In addition, Associate Professor Alex F. Antunes, at the Department of Geology, Federal University of Rio Grande do Norte (URFN/Brazil), implemented the resource as a **Jupyter Book, and translated the material to Portuguese.**

Please feel free to use this material for teaching and research. If you have any comments or want to contribute to the resource, please contact me at nestor.cardozo@uis.no

Manual: Working with the resource

The resource consists of a book in [pdf format](#), and a [source folder](#) where data, functions and notebooks are included. The book is a large, full-resolution file (**14 MB**). Alternatively, the resource can be reviewed using this Jupyter Book.

The programming language of choice is Python, and our approach is as follows: We introduce briefly the theory and applications, implement them in Python functions, and illustrate them using Jupyter notebooks.

Clone the repository

The best way to work with the resource is to clone this [repository](#). This saves all material to your local machine. It behaves almost like a copy.

- Open a terminal.
- Navigate to the folder where you would like to store the local copy of the repository. (cd **foldername**)
- Press the green button **Code** on the right hand side and copy the path in the Clone section.
- Execute the terminal command **git clone <https://github.com/nfcd/compGeo>**.
- Now you can start working with the resource files. They are saved in the folder you chose in step 2.

Updating your local files

Once in a while you should update your local files to the latest changes in the repository. This is important since we will be making changes and including new chapters along.

- Open a terminal.
- Navigate inside the folder of the repository on your machine. (cd **foldername**)
- Execute the terminal command **git pull**

Note

If using this Jupyter Book, you don't need to clone and update the repository, but you can run the code in the Book interactively.

To run code cells interactively, point the mouse to the  icon **positioned in the upper right portion** of the book and click on  **Live Code** . ~~You will notice that the~~ buttons    will appear.

Click the  button to run the **cell**; ~~click~~ the  button to restart the **kernel** or the  button to restart the kernel and run all cells.

Be **patience**. The first time you click the  button, it may take a while to run the cell.

As an example, activate Live Code now and click run in the following code cell:

```
print('Welcome to the Computational Geosciences resource!\n')
print('See below some tips to write beautiful and clean code in Python:\n')
import this
```

Note

Book content can also be run as Jupyter notebooks via Binder. To do so, click on the  **Binder** icon under the  icon.

Background information

The notebooks follow the directory structure of the resource, which is based on data, functions and notebooks folders. We recommend that you follow the same directory structure when running the notebooks.

Current state

The first nine chapters are completed. The latest revision of these chapters on Dec. 2022 was significant. The last chapter (Ch. 10) on the inversion problem is under work.

Check out the content pages bundled with this book to see more.

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