

Internship in Python Programming applied to Reservoir Engineering

Summary

- **Length:** 6 months
- **Location:** 232 Avenue Napoléon Bonaparte, Rueil-Malmaison, 92500, France
- **Reference:** RP-2022-03
- **Starting Date:** March-December 2022
- **Internship paid and compliant with school conventions**

Title

Consolidation of Python-based applications developed for Reservoir Engineering problems.

Intern profile

Final year student enrolled in a master's degree program with skills in Python (and R) programming with existing knowledge of the following libraries: dash, plotly, pandas. A taste for oil reservoir engineering or petroleum geosciences is preferred, but not required. A good understanding and intuition to represent physical phenomena is needed if the intern has not specifically studied reservoir engineering.

Objectives

To ease routine analysis tasks related to its reservoir engineering studies for petroleum systems, Beicip-Franlab has developed several applications in Python or R programming languages, each dedicated to separate tasks (specific visualizations, analytical computations ...).

The first objective of this internship is to consolidate the existing work by:

- Reviewing the existing code for various tools/applications (Python and R languages);
- Re-write in Python language some of the applications currently coded in R;
- Finalize the development of an application/tool aiming at modelling the relationship between injectors and producers (wells) based on a simple model inherited from electronics' analogy.

As a second objective, depending on the progress of the internship and separate on-going activities, the candidate will work on applying Machine Learning algorithms to solve specific reservoir engineering problems, and/or integrate these algorithms in robust workflows/apps that will be further used by Beicip-Franlab engineers. Such Machine Learning applications might cover:

- The use of supervised learning algorithms to generate proxy models to numerical simulators;
- The use of clustering algorithms to analyze measured data related to historical oil production;
- The use of neural networks to predict future oil wells' behaviors.

Main tasks undertaken during the internship

- Critical review of several existing codes used for reservoir engineering apps (Python and R) and translation of some codes from R to Python language
- Finalization of a Capacitance-Resistance Model in Python
- Redaction of relevant supportive material to document the consolidated codes
- Continuation and consolidation of Machine Learning applications to several reservoir engineering problems
- Participation to other (shorter) Data Science tasks, if any and if deemed relevant

Software used

Python (compulsory), in particular with the following libraries: dash, plotly, pandas
Knowledge of R is an advantage, though it is not compulsory

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