Python-Powered Workflows in Geosciences: From Automation to Innovation

Claude Cavelius*†[1], Hadrien Meyer[1], and Marie Callies[1]

[1]DeepLime – DeepLime – France

Résumé

Python has become an essential tool for geoscientists over the past decade. Its scripting capabilities, combined with its rich ecosystem of scientific and graphical libraries, enable efficient exploration of large datasets, versatile computations, and powerful automation, through simple scripts to complex AI-driven models. From data mining to full modeling workflows, Python accelerates work and fosters innovation at multiple levels.
However it can be a hurdle to go from a prototype to an actual Python application deployed to end-users. Two of the major challenges lie around interfacing Python scripts and recreating the proper execution environment to end-users that don't have any Python knowledge. We propose 2 digital tools, an open-source Python library and a public collaborative cloud platform to tackle these problems, specifically targeting scientific workflows. They allow to automate the generation of User Interface (UI) as well as streamline the deployment process, therefore reducing the amount of time and frustration required to do so.
We will then showcase practical geoscience applications from the open-source community to illustrate it. The use of Python proves to be a game-changer in the geoscience landscape, enhancing efficiency, reducing errors, and empowering geoscientists with powerful, adaptable solutions tailored to academic and industry needs.

Mots-Clés: Python, prototyping, geoscience applications, workflows, deployment

*Intervenant
†Auteur correspondant: claude.cavelius@deeplime.io