

What Open Source Can Do for Your Well Data — The Dlisio Story

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Abstract

Analytics and machine learning for well log data rely on complete and relatively large datasets encompassing a range of geological situations and log statistics. The .las file format is the easiest to read and load of well log formats. However, there is bias with .las files most often present in newer wells and “wells of interest”. Additionally, .las files are most distant from acquisition and can include interpolation, the absence of important metadata, and human meddling. Because .las files are simple in structure, recent open source tools, such as lasio and welly, load and analyze these files with Python programming language. In contrast, .dlis files are data heavy and structurally complex, containing curve values, parameters, calibrations, comments and other metadata. They are also binary, meaning expensive and/or specialty software is needed to load and process them, often on a one file at a time basis and sometimes disregarding key pieces of data. We present a new model in the geosciences of contributing to and utilizing open source software. To create better access to file formats foundational to well log analytics workflows, a .dlis parser called dlisio was developed under an open source license, free to use for both commercial and non-commercial needs. Dlisio was rapidly developed by Equinor internally in a continuous feedback loop of data scientists, software developers, and an exploration asset. Using several sprints, the code was developed sequentially with testing and feedback occurring on actual asset datasets to quickly evaluate the benefits and ease of use for geoscientists and data scientists. Externally, community additions contributed to the project to find bugs and fixes faster than Equinor could. In application of dlisio inside Equinor, the exploration asset was able to ingest, index, and analyze 84000 dlis files from the NCS and UK offshore, including image logs and mud gas data - data types often underutilized. Combined with

the existing open source .las parsers, most common well data file types are now able to be loaded and analyzed with Python. This allows input directly into machine learning workflows or data visualization. Because dlisio is free software, it is easy to distribute and can quickly leverage infrastructure supporting open source in the cloud. By embracing open source software, access to well log data is simplified and provides foundation to everyone to advance their work in well log analytics.