Challenge's Topic

MACHINE LEARNING SOLUTIONS FOR LITHOLOGY IDENTIFICATION IN THE ECUADOR ORIENTE BASIN

Introduction

Data sciences are already playing an important role in addressing several industry challenges. Industry leaders have validated these claims and have recognized that there is a workforce shortage in skilled data sciences with an understanding of the energy industry.

The volume of data within the oil and gas industry is vast, with new data being generated daily. In order to better understand the subsurface and reduce uncertainty, this data needs to be integrated and interpreted consistently. Given the volume of data and limited resources, traditional approaches can never hope to incorporate all the data that is potentially available. The result being that there can be significant gaps in our understanding and high levels of subsurface uncertainty.

That arises the need to: create a dynamic understanding of subsurface stratigraphy, a fast interpretation of large datasets, work with limit resources and at the end obtain a consistent interpretation.

Scopes/objectives

Provide a bird-eye view of the data analytics process, explain the necessary step to get the feel of the data and data preprocessing, a necessary step to clean and format the data before building machine learning models. Moreover, have an insight into supervised machine learning concepts that allow the creation of data-driven models via supervised machine learning algorithms. Two representative machine learning algorithms - one for classification and the other for regression – could be implemented. Learning will be reinforced with a hands-on lab using free software, like Orange, and also industrial solutions like Landmark's Assisted Lithology Interpretation (ALI).

Use a supervised machine learning technique to predict lithology from wireline log responses according to a trained model to support rapid and consistent lithology interpretation.

- As more data become available, we need a solution that offer interpretations updates automatically.

- Process thousands of wells simultaneously in a matter of minutes, resulting in more effective evaluation operations, improved efficiency, and reduced costs.

- To rapidly conduct multi-scenario analysis on the same datasets to aid lithology prediction and reduce subsurface uncertainty, in order to accelerated decision-making cycle.

Careers involved

1 Petroleum Engineer, 1 Petroleum Geology and 2 Systems/Computer Science students are the minimum.

Other aspects

Free software for Machine Learning Orange, and access to DecisionSpace® 365 Assisted Lithology Interpretation.