Company description:

smartFeatures.ai is a startup company located in Bergen, engaging three persons with more than 60 years of relevant experience. The company is developing technology combining machine learning and domain expertise for automatically computing key reservoir properties from measured well log data. The technology is currently being used for generating a database containing lithology, porosity and water saturation of the reservoirs found in exploration and production wells on the Norwegian continental shelf. Recently, a proof-of-concept project was successfully performed for two oil companies.

ML-Project for UiO Data science students

Project 1 – Well tops prediction

Aim:

Identify well tops from well log data and information from nearby offset wells

Background:

The subsurface of the earth is typically layered, and commonly characterized by lithostratigraphy, i.e. layers of similar lithological character or rock type. The lithostratigraphy is generally split in 2 levels, the first is called *group*, which again is split into one or more *formations*. The top of each formation/group is referred to as *well top*. Knowledge about the lithostratigraphy is important in production and exploration for oil and gas as only a few formations contain oil or gas. The location of the well tops in a borehole is interpreted by experts studying well log data (measurements of various physical properties such as natural and induced radioactivity, sound velocity, resistivity) and cuttings information (expert descriptions of the rock coming out of the well during drilling). The process is time consuming and different experts may arrive at different interpretations. It is interesting to be able to automatically identify these well tops in cases where these are not yet known, but also to QC interpretations from the experts.

Task:

Try to predict the location of well tops in a well, given well log data from the same well and well tops information and corresponding well log data from nearby, offset wells. Try to estimate accuracy/confidence of predictions and possibly understand on what basis the predictions are made. One simple first phase is to apply correlation analysis, and a second more advanced phase apply some kind of supervised learning model. We do have access to well tops and corresponding relevant well log data from more than 1000 wells on the Norwegian continental shelf.

Project 2 – Lithology classification from well log data

Aim:

Classify lithology from standard well log data

Background:

The subsurface consists of several different types of lithology, or rock types, and such information is crucial when drilling, exploring and producing oil and gas. The standard procedure for determining lithology is by experts interpreting different sources of information from wells. Recently, one has started to apply machine learning for supervised training of models using standard well log data. These models have shown some success, but it has turned out to be difficult to properly account for the strong correlation that exist with depth.

Task:

Classify lithology from standard well log data using supervised learning. Try to incorporate/account for the strong depth correlation. Evaluate prediction accuracy and understand the basis for the prediction. We have access to a dataset containing standard well log data and expert interpretations for about 200 wells.