

Advanced Seismic Interpretation based on using Artificial Intelligence

This new course will be permanently “under construction”. That means there will never be a final version. The reason is that progress in the use of Machine Learning (ML) in geophysics is astonishing and forces me to update often to keep abreast of the latest developments.

Seismic interpretation has various aspects: structural, stratigraphic and quantitative and in all these ML is being used increasingly. Also, the use of Large Language Models, like ChatGPT and Copilot, although not perfect yet, will play an increasing role in the interpretation workflows.

To characterize/classify seismic data (too) many attributes can be calculated. But to keep the interpretation tractable Principal Component Analysis (PCA) or Independent Component Analysis (ICS) are used to handle the large number of possible attributes. In addition, there is a whole range of Machine Learning options. A clustering example is the use of K-PCA, where K stands for kernel in which PCA is extended to non-linear relationships in the data using Kernel functions. This is only one of the many capabilities of ML that will be used in the Advanced Seismic Interpretation course.