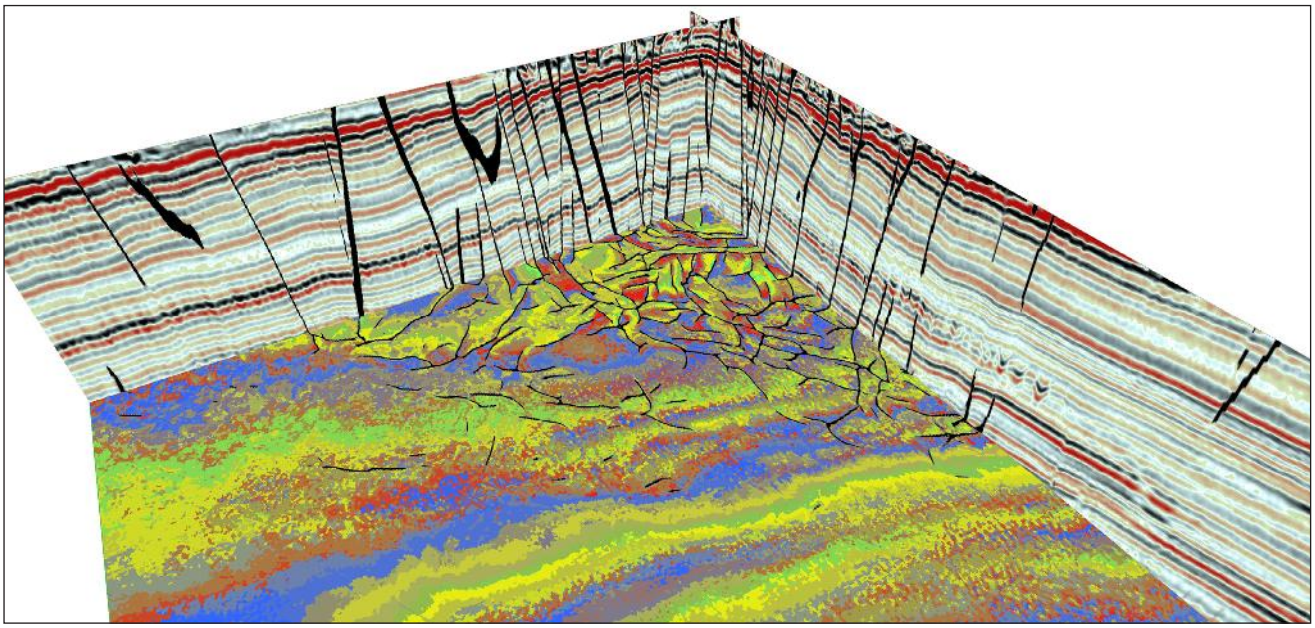
Deep Learning **Fault Detection**

Overview

Most faults in seismic data are straightforward to see, understand, and interpret. This repetitive task is ideally suited for the automated workflow available in the Paradise Deep Learning (DL) Fault Detection product. Using Graphics Processing Unit (GPU) technology, the tool dramatically runs in a matter of minutes to a few hours over large areas, reducing the time to identify faults in a volume. See examples below.

DL Fault Detection is equipped with general pre-trained learning engines (conservative and aggressive models), enabling their application to a wide range of seismic data without the need of user-provided fault examples for training. In normal fault-prone basins, DL Fault Detection produces...

- Fewer false positives
- Lower sensitivity to artifacts and noise
- Generates a more accurate, complete understanding of the subsurface



Example of where the CNN fault engine has been applied to a Multi-Attribute Classification using a Self-Organizing Map (SOM) to better identify faults. Some instantaneous attributes are sensitive to reflector continuity.

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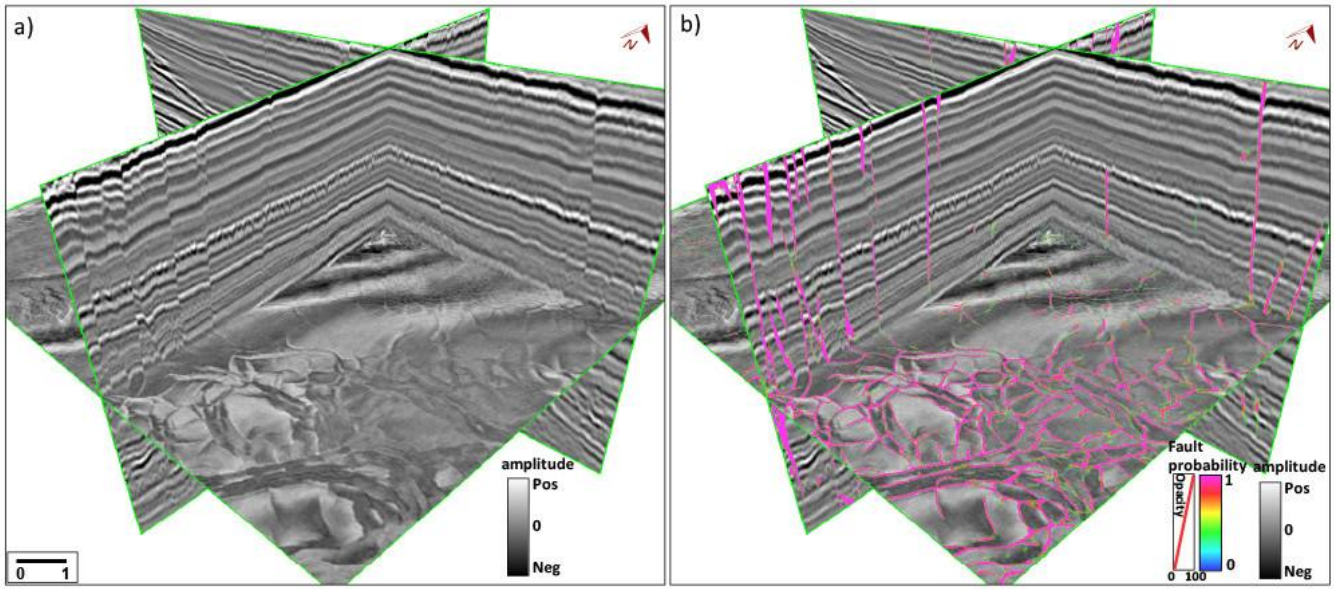
Application requires an Nvidia Quadro GPU with at least 8 GB of VRAM to support the deep learning processes.



Fault detection result on a seismic survey from the Great South Basin, offshore New Zealand. a) Seismic amplitude data on which fault detection is performed. b) Fault probability from the CNN-based fault detection.

How it works

The traditional input attributes contain far too much noise for automated fault interpretation processes. It's the attribute that's the problem. Instead of focusing on filtering and image manipulation, DL Fault Detection in Paradise produces a fault attribute volume - "Deep Learning Fault Probability." An interpreter using DL Fault Detection receives the equivalent of an optimized "fault enhanced" similarity volume that is far more suitable for automated extraction than anything generated using traditional manual methods.

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