HampsonRussell

Comprehensive Geophysical Solutions

HampsonRussell is a comprehensive suite of reservoir characterization tools that integrates visualization and geophysical workflows for well logs and seismic data into an easily navigated intuitive package for fast results. With advanced algorithms known for their ease of use, **HampsonRussell** makes sophisticated geophysical techniques accessible to all geophysicists.

Available workflows include:

- AVO (Amplitude Versus Offset) modeling and analysis
- Conditioning of prestack gathers
- Poststack and prestack inversion methods, EEI (Extended Elastic Impedance)
- Stochastic inversion and Bayesian classification tools
- Joint PP and PS inversion
- 4D volume matching and analysis
- AVAz (Amplitude Versus Azimuth) analysis and modeling
- Advanced attribute computation
- Multi-attribute analysis and neural network-based log and volume predictions
- Deep learning methods for predictions of rock and reservoir property volume

Geoview (Seismic & Logs)

These key modules provide the foundation for the **HampsonRussell** product suite that provides users with the power to visualize, interpret and manage their seismic reservoir characterization projects easily and efficiently. The integrated design of **Geoview** empowers users to access all **HampsonRussell** modules, their project data and processes from one centralized location.

Tools are provided to prepare and manage seismic data for use in seismic inversion, AVO analysis, reservoir characterization and visualization. Edit, create, or transform well log data for input into other petrophysical and modeling workflows.

Geoview also includes a set of pre-loaded process workflows that can be easily customized and shared with other users, as well as batch and chained processing which also increase efficiency. Integrated log and seismic interpretation tools give users the power to create accurate reservoir interpretations using crossplots, logs, volume attributes, horizons and data slices. This foundational product enables simultaneous viewing and manipulation of vertical profiles, models, maps, wavelets, and well log displays.
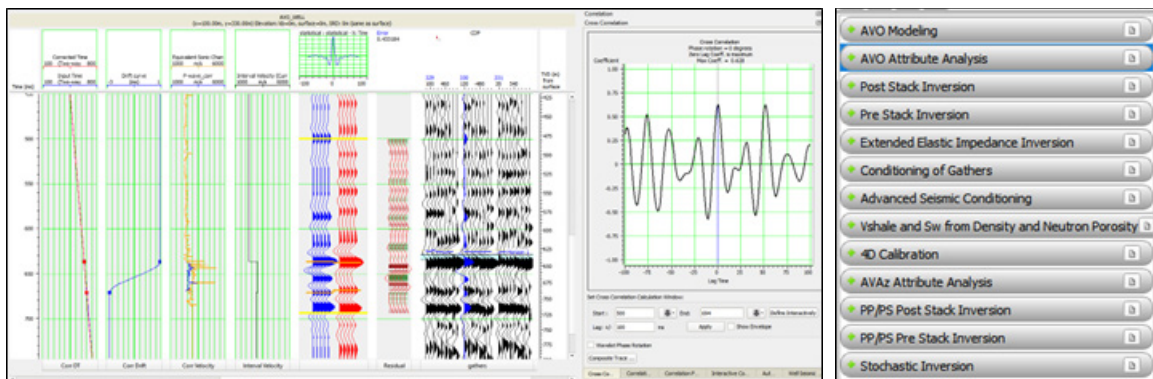
AVO

AVO specializes in prestack seismic analysis and reservoir reconnaissance. This module has the tools for conditioning prestack seismic data to produce optimum attribute volumes, cross-plotting and interpretation functions for locating AVO anomalies, and AVO modeling tools for calibration.
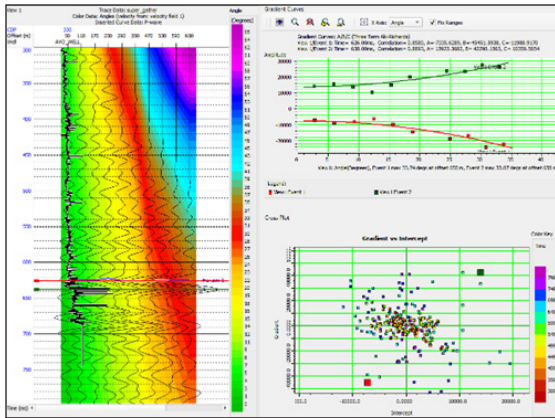

Strata

Strata performs both poststack and prestack inversions. In the conventional poststack domain, Strata analyzes poststack seismic volumes to produce an acoustic impedance volume. In the prestack domain, **Strata** analyzes angle gathers or angle stacks to produce volumes of acoustic impedance, shear impedance and density.
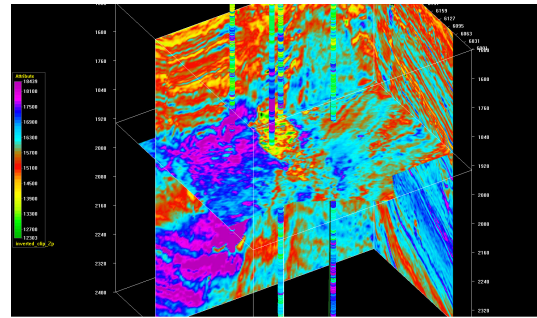

Emerge

Emerge enables geostatistical, volumetric attribute prediction using well logs and attributes from seismic data. The predicted properties can be any available log types: such as porosity, velocity, density, gamma-ray, lithology and water saturation. **Emerge** can also be used to predict missing logs or parts of logs by leveraging existing logs that are common to the available wells.
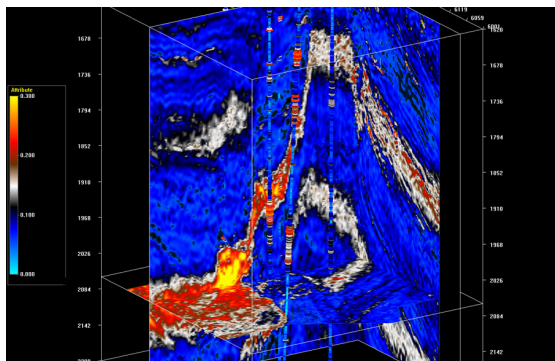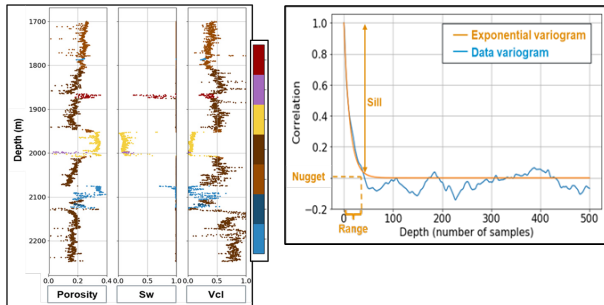

GeoAI

GeoAI provides an innovative approach to seismic reservoir characterization that simultaneously predicts multiple reservoir properties using a streamlined machine learning workflow. This method uses a rock physics driven machine learning technique, which is informed by rock physics theory and statistical simulations to generate synthetic data for a range of geological scenarios. By employing Convolutional Neural Networks (CNNs), **GeoAI** can efficiently estimate multiple rock property volumes with high resolution and agreement to blind wells.
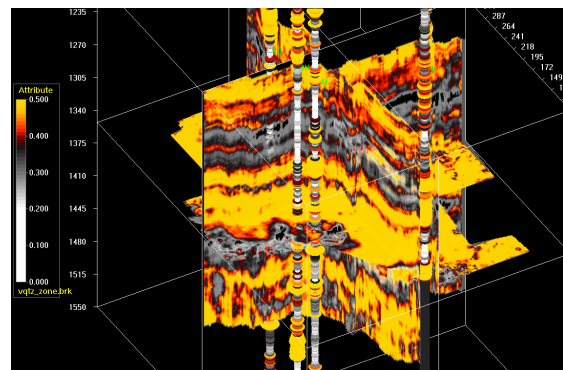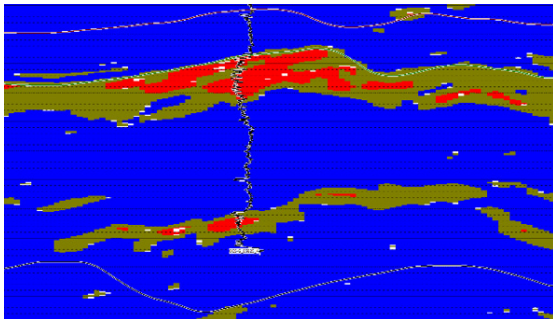
WellGen

WellGen enables the generation of synthetic data for Machine Learning applications. It simulates many pseudo-wells based on the well statistics in the project area. Elastic and synthetic seismic data are then generated using rock physics and seismic theory. The resulting collection of pseudo-well logs and synthetic seismic data, called the synthetic catalog can be used to train the Deep feed-forward neural networks (DFNN) in Emerge for seismic reservoir characterization. WellGen is one of the components of GeoAI, machine learning product.
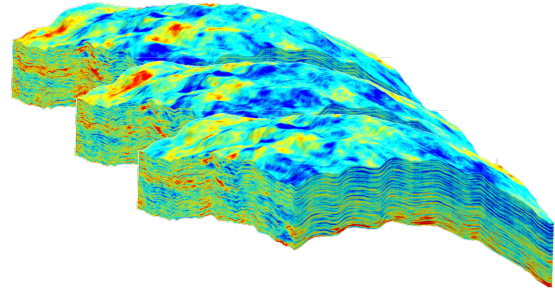

GeoSI

GeoSI is a prestack simultaneous elastic inversion that generates high-frequency stochastic models for high-resolution reservoir characterization and uncertainty analysis. It addresses the band-limited nature of deterministic inversion methods and integrates well data and seismic data at a fine scale within a stratigraphic geomodel framework.

LithoSI

LithoSI quantifies uncertainty in seismic lithology and fluid prediction. Using multiple elastic parameters from the inversion of seismic data, **LithoSI** performs a supervised Bayesian classification to deliver probability cubes of predicted lithology and/or fluid properties. The integrated inversion and classification workflow provides superior definition of lithology classes and allows more accurate assessment of lithology probabilities.


RockSI

RockSI provides a powerful solution for exploring the link between rock properties and seismic data for quantitative interpretation and feasibility studies. It can create detailed Rock Physics Models (RPMs), calibrate them with well data, and generate 3D and 4D Rock Physics Templates which show the relationship between seismic attributes, lithology, saturation, and pressure. It also provides statistical rock physics capabilities using Monte Carlo simulation to create training sets for lithology classification when well data are sparse or simulate the seismic signature of different production scenarios.
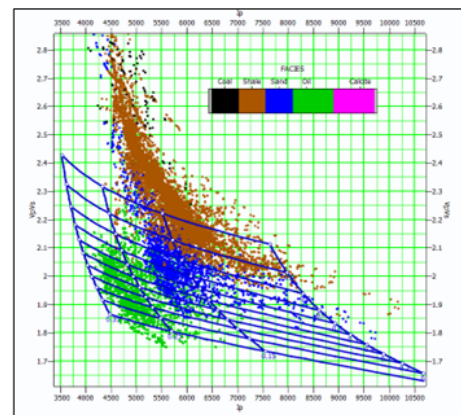
ProAZ

ProAZ provides analysis to map fractures and predict stress by observing azimuthal variations in the P-wave seismic data. Prestack azimuthally processed seismic data are analyzed in terms of time and amplitude azimuthal variations attributed to anisotropic effects. **ProAZ** provides a series of tools to enable interpreters to interactively explore azimuthal variations in their datasets and generate azimuthal attributes to summarize the results.
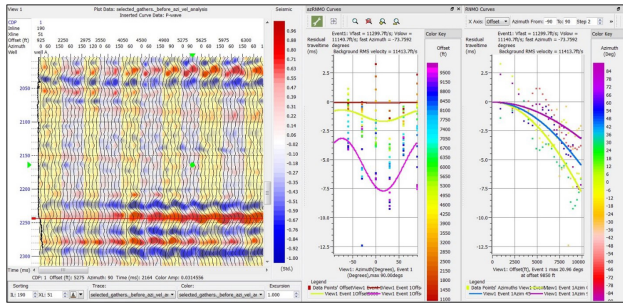

Pro4D

Pro4D enables timelapse studies to track production-related changes in a reservoir and determine areas of bypassed reserves or inefficient production. **Pro4D**'s complete suite of tools can model a whole range of anticipated reservoir scenarios, both at log and synthetic seismic scale in terms of temperature, pressure and fluid saturations.
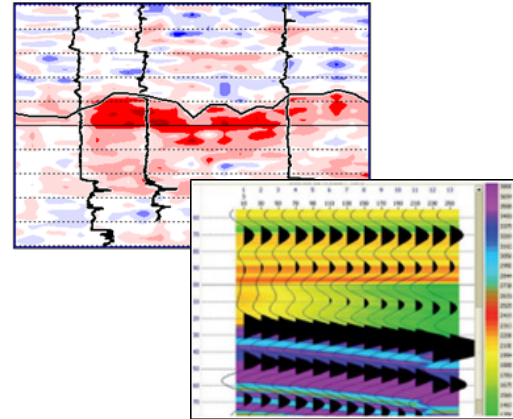

ProMC

ProMC allows consistent interpretation of multicomponent data. It addresses the challenges of differences in event times, frequencies and reflectivity between PP and PS seismic volumes. The easy-to-use and intuitive work environment offers interpreters the ability to handle the increased number of seismic and attribute volumes inherent in a multicomponent project.
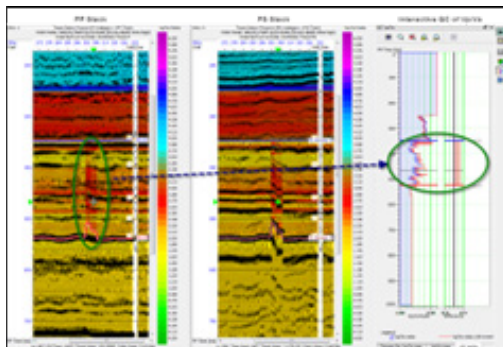

MapPredict

MapPredict is a mapping tool that statistically compares and analyzes mapped data. It generates maps using both sparse data measured at isolated wellbores and dense data measured on a survey grid. It is a comprehensive, easy-to-use, map-based geostatistical software that integrates datasets into accurate, detailed maps.

Among the tools in MapPredict is a set of geostatistical analysis tools for measuring and modeling the spatial continuity patterns. In addition, MapPredict uses our powerful Emerge algorithm to analyze which combination of mapped seismic attributes is most appropriate for your application.
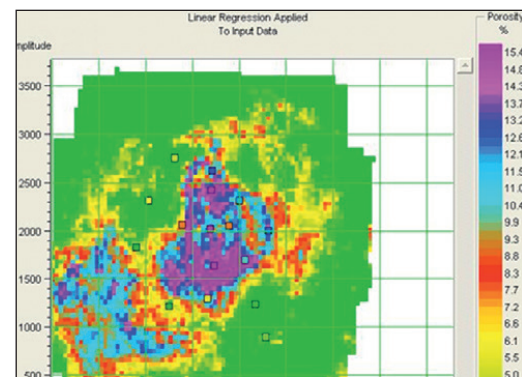
Attributes

Attributes is a package designed to create and extract a collection of advanced, multi-trace seismic attributes. These enhance the ability of seismic interpreters to analyse frequency content, reduce noise and detect fractures and other discontinuous features in seismic volumes.
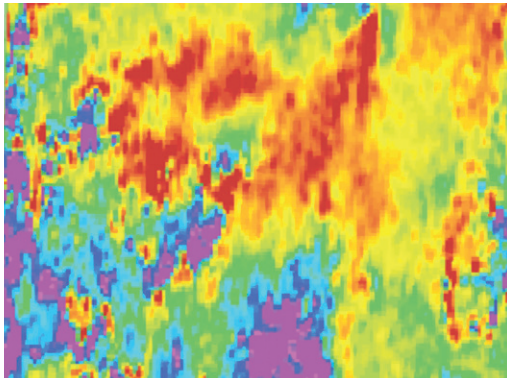
Gather Conditioning

This specialized set of applications improves the signal-to-noise ratio and alignment of CDP gather data in preparation for any prestack analysis process such as AVO or simultaneous inversion.
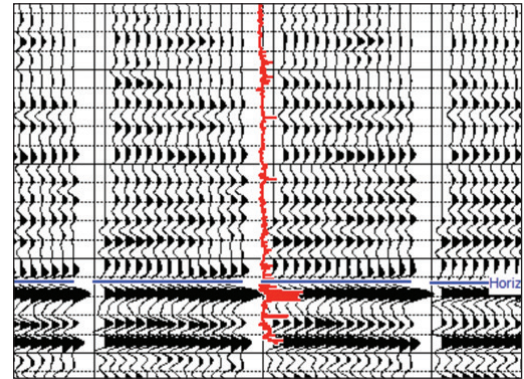

Advanced Seismic Conditioning

The goal of this product is to improve the match between near, mid and far angle stacks before input to inversion. **Advanced Seismic Conditioning** uses features from Pro4D and is designed to match the characteristics of near, mid and far angle stacks to each other, thereby increasing the accuracy of inversion.

AVO Fluid Inversion (AFI)

AVO Fluid Inversion (AFI) estimates uncertainty in fluid predictions from AVO. **AFI** uses Biot-Gassmann fluid substitution, Monte Carlo simulation and Bayesian estimation to build fluid probability maps. These maps help in quantitative analysis of the probability of exploration success.
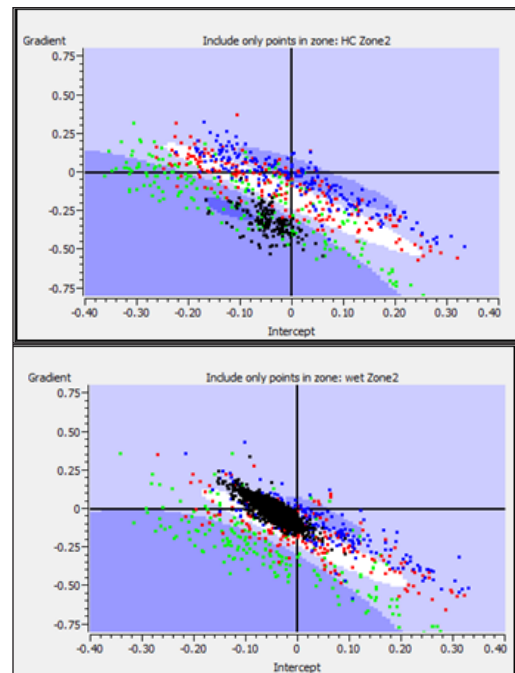
Accelerators: MNP (Multi-node Processing, Batch, Additional 12 Threads)

HampsonRussell accelerators significantly improve workflow efficiency by reducing processing time and optimizing the utilization of computing resources.

Multi-Node Processing (MNP) enables the execution of complex processes across single or multiple machines seamlessly, whether on-premises or in the cloud. This distributed computing capability ensures rapid results and efficient resource allocation.

Batch processing increases productivity and efficiency. Batch runs as a separate executable and allows to schedule or queue up time-consuming processes. Batch does not require the main Geoview program to be running, having its own Geoview Batch Controller to monitor jobs.

Additional 12 Threads increases project efficiency and the performance of computationally expensive processes. This license can add 12 additional threads beyond the 12 that the software already accesses. Estimate the optimal number of threads to use when running a process for the best hardware performance.
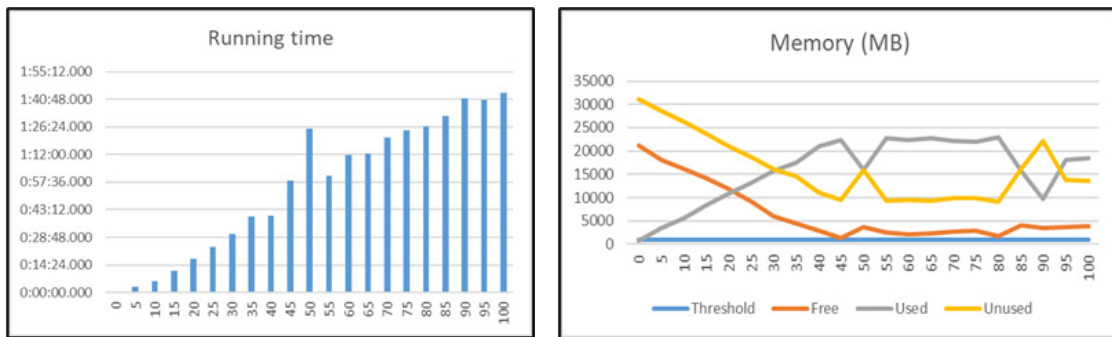
Training and Support

HampsonRussell provides technical support and training through a global network of offices. We offer public workshops and custom in-house training based on your ongoing projects. We provide support and training to help you get the most from your geophysical data. Whether your goals are prospect ranking, field development or maximizing recovery from mature or unconventional reservoirs, **HampsonRussell** offers a unique combination of technology and expertise.

HampsonRussell
Comprehensive Geophysical Solutions

GeoSoftware™

GeoSoftware provides the industry's preferred comprehensive set of software products and support for E&P multi-disciplinary teamwork.

High-end, cross-product workflows enable a better understanding of reservoir properties and how they evolve through the life of the field.

GeoSoftware helps reduce reservoir risk and uncertainty in seismic reservoir characterization, velocity modeling, advanced interpretation, petrophysics, rock physics, AVO and geological modeling. The GeoSoftware portfolio includes **HampsonRussell**, **Jason**, **PowerLog, and InsightEarth.**

TO LEARN MORE, VISIT:
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