PaleoScan™ 2018
Expand your Horizons

Global Seismic Interpretation Software
Who We Are

Ellis is an innovative geoscience company providing seismic interpretation software and services to the Oil and Gas industry. Our mission is to bridge geosciences and computer technologies and bring new comprehensive solutions to geoscientists to better understand the geology behind seismic data and improve the quality while drastically reducing the time of interpretation.

What We Do

Software

PaleoScan™ is an integrated seismic interpretation software offering an innovative workflow that increases productivity and resolution. Thanks to a comprehensive approach, a geological model is generated while interpreting the seismic volume. It changes the way to look at seismic data and takes interpretation a step further in the exploration and production process.

Services

Ellis provides a wide range of services, on-site or in-house, from tailor-made solutions to full case studies. Our geoscientists have extensive experience in interpreting seismic data from all over the world. With our input, clients can better understand the geology and characterize the reservoirs.

What We Offer

Data Reconnaissance

In frontier exploration, new ventures and large scale projects, PaleoScan™ allows to quickly assess the hydrocarbon prospectivity of seismic datasets. It is used advantageously in data room environment for peer review and geological evaluation with partners.

Exploration

Identify prospects at a very early stage of the exploration cycle and image reservoir geometry. The tools to map attributes on large number of horizons and to extract geobodies are precious for de-risking drilling decisions.

Development

Understand reservoir properties with high resolution interpreted surfaces and subtle fault imaging. Well logs and markers, advanced seismic to well tie and rock properties prediction are some of the quantitative results of the PaleoScan™ workflow.
Full Featured Seismic Interpretation Platform

PaleoScan™ is a new generation of seismic interpretation platform. It includes all the necessary tools to run a comprehensive workflow, from data loading to generation of interpreted objects in a user-friendly environment. Thanks to rapid data screening, interactive cross-navigation and powerful editing tools, the interpretation can be refined and the geological model can be previewed in real-time. A suite of applications allows the generation of horizons, the stratigraphic slicing of volumes, the extraction and quantification of geobodies, the enhancement and characterization of faults, and the cross-correlation of wells and markers. PaleoScan™ runs on Windows® and takes advantage of parallel computing with the latest multi-core technologies.

Add-on Modules

Advanced Interpretation
- Sequence Stratigraphy
- Waterflood Model
- Automatic Geobody Extraction
- Color Blending

Time Depth
- Seismic to Well Tie
- Velocity Modeling
- Depth Conversion

Properties Modeling
- Kriging/Co-kriging
- Rock Properties Modeling
- Synthetic Seismic
- Interval Velocities Generation

Data Connector
- Petrel®
- OpenWorks™
- GeoTeric™

Core Application
- 2D & 3D Seismic Interpretation
- Coordinate Reference System
- Integrated 2D and 3D viewers
- Rapid data screening
- Co-rendering
- Sessions and custom settings
- Multi survey and large dataset
- Horizon/Fault Interpretation
- Stratigraphy
- Attributes and Calculator
- Geobodies Extraction
- Volumetrics Calculation
- Gross Rock Volume
- Well Correlation
- Spectral Blending
- Colored Inversion
- Cross Plot and Classification

Why Choose PaleoScan™?

Innovative Solutions
PaleoScan™ is a new generation of seismic interpretation platform using machine learning augmented technology. In a fully integrated 2D and 3D environment, it offers a complete range of interpretation tools, from data reconnaissance to reservoir characterization.

A Comprehensive Approach
PaleoScan™ enables you to comprehensively interpret seismic volumes and simultaneously build geological models. Thanks to real-time modeling and control tools, the seismic interpretation goes further along the E&P workflow.

High Resolution
Interpret at sub-seismic resolution. An unlimited number of horizons can be generated from the model at very fine scale to identify prospects, correlate wells and markers, and better characterize reservoirs.

Increase Productivity
Our computer-aided methodology empowers you to go further and faster in the seismic interpretation. Your results are used for stratigraphic analysis, structural modeling and quantitative interpretation.

Integrated Solution
PaleoScan™ is an integrated solution which manages all the standard formats of the oil and gas industry including seismic, well, horizon and fault data. It also proposes direct links to other platforms for a seamless data exchange.

Excellent Support
Our geoscience and IT teams based in France (Montpellier), the United States (Houston), Australia (Perth), Malaysia (Kuala Lumpur) and Brazil (Rio de Janeiro) provide first-rate support to PaleoScan™ users either online or onsite.
A Comprehensive Method for Seismic Interpretation

PaleoScan™’s global method is a semi-automatic workflow, where a geological model is computed while the seismic data is being interpreted. Horizons are auto-tracked across the full seismic volume, chrono-stratigraphically sorted in real time and used to generate a geological model. PaleoScan™ makes this process fully interactive for the geoscientist, who can refine the interpretation of every horizon and increase iteratively the level of accuracy of the geological model. The interpretation is therefore faster and of better quality. The method can be applied to both 2D and 3D datasets.

- Grid made of millions of horizon patches
- Manage peak, trough, zero crossing and inflection points
- Automatic horizon tracking
- Fast and interactive editing
- Geological model preview in real time

Relative Geological Time Model

Global interpretation in PaleoScan™ consists of a three-step computer aided workflow. During the first step, a grid of horizon patches (the Model Grid) is generated across the entire seismic volume for each polarity (peak, trough, zero crossing, and inflection point).

The size of the patches is defined by the interpreter according to the scale of the prospective area and the complexity of the geological settings. In the second step, those patches are linked automatically thanks to a global cost function minimization process based on the distance and the correlation of neighboring patches.

A chronostatigraphic sorting is automatically performed to assign relative geological ages to all the horizon patches. During this second phase, the interpreter edits interactively the connections between auto-tracked horizons and updates the model in real time to obtain an optimum solution. In the third and last step, the auto-tracked and refined Model-Grid is used to compute the final Relative Geological Time model (the GeoModel), from which a whole suite of interpretative applications is derived.

One of the main applications is the capability to extract an infinite number of iso-age surfaces from the GeoModel through the Horizon Stack, which allows an ultra-fine stratal-slicing of the seismic volume for the detection and characterization of very fine geological features.

Now also available on 2D seismic

Through a user friendly seismic 2D lines interface and a pseudo-3D environment, single and multi 2D lines can be interpreted rapidly using an innovative workflow.

- Single and multiple 2D line Interpretation
- M-Inter correction with dynamic shift
- 2D Model-Grid, 2D GeoModel, 2D Horizon Stack
- Horizon picking and 2D tracking along arbitrary lines
- Pseudo 3D GeoModel creation
**Interpretation**

- Horizon & Stratigraphic Slicing
  - Horizon stack generation from the model
  - Seismic horizons honoring polarities
  - Sub-seismic resolution
  - Dynamic flattening from stratigraphic slices

- Geobody Modeling
  - Extract geobodies based on amplitude contrasts on horizon stacks
  - Automatic or manual contouring
  - Volumetric computation

- Fault Interpretation
  - Semi-automatic fault package merging and splitting
  - Dip/Azimuth filter with interactive stereonet
  - Fast and interactive tool to optimize fault interpretation
  - High resolution throw mapping

**Attributes**

- **Surfaces Attributes**

- **Geological Attributes**

- **Volume Attributes**

- **Spectral Decomposition**
  - Instantaneous time-frequency transformation
  - Short Time Fourier Transform
  - Continuous Wavelet Transform
  - Real-time RGB blending

- **Denoising**
  - Structure-oriented smoothing
  - Based on the vector field direction
  - Real-time smoothing

- **Spectral Blurring**
  - Vertical resolution enhancement
  - Interactive process
  - Real-time preview

**Characterization**

- **Well Correlation**
  - Interactive display of logs and markers
  - Compare seismic interpretation and well markers
  - Highlight well-seismic mis-alignments
  - Flatten logs on horizons or markers

- **Cross Plot & Classification**
  - Cross plotting of volumes
  - Interactive classification
  - Geobody extraction and facies volume generation

- **Colored Inversion**
  - Interactive colored inversion
  - Real-time preview
  - Relative and absolute AI

A broad panel of attributes can be computed on seismic data, geological models or surfaces to reveal stratigraphic as well as structural events. A cross comparison can be performed by using interactive co-rendering data and synchronized views. A calculator with real-time preview enables the generation of custom attributes.
Sequence Stratigraphy
Build a lithostratigraphic framework and understand the relationship between rocks and stratigraphic evolution at an early stage of interpretation.
- Generate an interactive Wheeler diagram
- Interpret depositional sequences
- Create geological cross sections with lithology
- Build sequences in 3D
- Create horizon stacks by layers

Watertight Model
After defining layers in the GeoModel, a watertight model is created in 3D in a defined zone of interest. Horizons and faults are remodeled and can be exported for geo-modeling applications.
- Interactive layering
- Watertight horizons and faults
- Creation of fault polygons
- Allen diagram for analysis of sealing properties

Automatic Geobody Extraction
Automatically extract geobodies from any attribute in a specific layer. Model in 3D stratigraphic traps, channels and fault zones.
- Select your target by leveling an attribute
- Specify the areas of interest
- Automatically extract geobodies in 3D
- Split or merge bodies

Color Blending
Improve the visualization of your prospects with an interactive color blender of volume and surface attributes. Various blending methods are proposed: RGB (Red, Green, Blue), CMY (Cyan, Magenta, Yellow), HSV (Hue, Saturation, Value), HSL (Hue, Saturation, Lightness).
- Real time frequency filtering
- Color blending on volumes, arbitrary lines and horizons
- Creation of a 256 color blended volume
Add-on Modules - Time Depth

Seismic to Well Tie
The interactive Seismic to Well Tie tool includes checkshot and sonic calibration, wavelet extraction and synthetic seismogram generation.
- Checkshot and sonic calibration
- Wavelet extractions (analytic, statistical, deterministic)
- Synthetic seismogram generation
- Interactive stretch and squeeze with undo/redo
- Interval velocity, drift velocity and correlation logs

Velocity Modeling
From the stratigraphic viewer, it is possible to create interactively a velocity model and use it to switch from time to depth domains in real time.
- Define a velocity model interactively
- Convert to depth in real time
- Use well velocity data if needed
- Compute Average, RMS and Dix velocities

Depth Conversion
Seismic images can be converted in real time from time to depth domain by assigning velocity models. Interpretation can be done in both domains interactively since the display of all objects is transformed within the viewer.
- Real time depth conversion of volumes and objects
- Check well calibration
- Control velocity volumes
- Save horizons and volumes in depth domain

Log Depth Adjustment
This tool provides an intuitive and quick way to adjust log data with seismic data in the depth domain. A simple shift or a stretch and squeeze can be applied to well logs in order to honor well markers and horizons from seismic interpretation depths.
- Log stretch and squeeze in depth
- Adjust depth values with undo/redo
- Honor well markers and seismic interpretation
- Check velocity models
Add-on Modules - Properties Modeling

Well log information can be populated in the seismic volume using the geological model as guideline. Various methods of propagation, such as inverse distance, kriging and co-kriging, are proposed in an intuitive interface offering real time preview on surface or cross section along wells.

This unique workflow constrained by the geology has numerous domains of application such as seismic inversion, reservoir characterization, geological correlation, velocity model building and synthetic seismic generation.

Relative Geological Time Model

- Propagate well log properties guided by geological time model
- Inverse distance, kriging and co-kriging methods
- Propagation parameters by stratigraphic sequences
- Precise rock physics distribution
- Variograms and anisotropy according to reservoir architecture
- Real time preview on horizons and lines along wells
- Intuitive and useful for Quantitative interpretation applications

Forward modeling
Generate synthetic seismic
Compare real and synthetic seismic

Rock type Prediction
AI "a priori" model for inversion
Generate porosity and sand volumes

Velocity Modeling
Create interval velocity model
Upgrade the velocity model with well data
PaleoScan™ 2018

Data Connector

The PaleoScan™ data link is an essential module for users who wish to maximize benefits from their PaleoScan™ experience. Thanks to a plug-in extension, users can take advantage of PaleoScan™ functionalities by exchanging interpretation results directly between various platforms such as Petrel®, Decision Space®, OpenWorks® and GeoTeric®. In just a few clicks, it enables seamless data exchange with PaleoScan™. Data is fetched from one application and sent to the other on-demand.

Petrel® - OpenWorks® - GeoTeric®

API

To build your own workflows in a separate environment with various objects and/or functions coming from PaleoScan™ Core application, you can use our API and its Software Development Kit (SDK). It is a fully object-oriented class library designed for software developers to embed our technology into any external application and/or software.

Requirements: Windows/Microsoft Visual Studio C++ environment.

Data I/O API

To communicate directly with the objects from PaleoScan™ projects, you can build your own link with other platforms or programs thanks to the Data I/O API. This API enables your application to read and write every object in a PaleoScan™ project, including volumes, horizons, faults, wells and logs.

Viewer

To share PaleoScan™ projects with colleagues, clients or partners, the PaleoScan Viewer is a light version of PaleoScan Core application. It gives access to most of the functions of the platform such as visualization in 2D and 3D, image blending, synchronization, rapid data screening, cross navigation and real time attributes. Export options in various formats are also available for every object (volume, horizon, fault, well, geobody, layer, multi-Z).

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