SeisSense™

SEG-Y 2D Merging Platform

Efficient & Scalable SEG-Y File Integration

SeisSense™
SEG-Y Merging Platform

Efficient & Scalable
SEG-Y File Integration

What is SeisSense™?

- A specialized platform designed for seamless integration and analysis of seismic data.
- Supports SEG-Y file handling, merging, quality control, and processing.

What is SeisSense™ SEG-Y Merging?

- **Transforming Seismic Data Integration with AI**
- **SeisSense™** SEG-Y 2D Merging Platform is a cutting-edge solution for automated seismic data merging, QC, and seamless integration of multiple SEG-Y files.
- **Key Capabilities:**
  - Automated SEG-Y File Parsing & Header Standardization.
  - Dynamic Coordinate Reference System (CRS) Handling.
  - Advanced Trace Merging Algorithms for Large Datasets.
  - AI-Powered Quality Control & Data Validation.
  - Scalable Processing for Seamless Data Integration.

- **Designed for:** Oil & Gas operators, seismic processing teams, geophysical researchers, and exploration companies.
- **Outcome:** A fast, efficient, and accurate way to merge multiple seismic datasets, ensuring high-quality subsurface imaging and interpretation.

Challenges in Merging Multiple SEG-Y Files

- Inconsistent Header Formats
- Different Coordinate Reference Systems (CRS)
- Varying Data Resolutions & Sampling Intervals
- Handling Large-Scale Data Efficiently
- Data Gaps & Overlaps

SeisSense™ Approach to SEG-Y Merging

- Automated parsing and validation of SEG-Y headers.
- Standardizing CRS for uniform integration.
- Aligning data resolution and sampling intervals.
- Handling missing data using interpolation techniques.
- Optimized memory handling for large datasets.

Detailed Workflow for SEG-Y Merging

Data Ingestion:

Load multiple SEG-Y files.

Identify different data sources and formats.

Header Standardization:

Align trace headers, coordinates, and metadata.

Ensure consistency in survey data.

Resolution Adjustment:

Interpolate missing traces.

Normalize sampling intervals across datasets.

Data Cleaning & Filtering:

Apply denoising techniques.

Remove inconsistencies in merged traces.

Merging & Alignment:

Detect overlaps and stitch together datasets.

Preserve amplitude and phase information.

AI-Enabled QC & Verification:

Compare against baseline seismic surveys.

Identify and flag anomalies in merged data.

Export & Reporting:

Generate final SEG-Y file.

Provide visualization and metadata logs.

AI Enabled Quality Control (QC) After Merging

Attribute-Based QC:

Compare merged seismic attributes (amplitude, phase, frequency).

Cross-plot analysis of reflection characteristics.

Fault & Anomaly Detection:

AI models scan merged data for missing traces or distortions.

Highlights potential errors introduced during merging.

Well Tie & Synthetic Seismogram Comparison:

Ensure correlation between seismic and well log data.

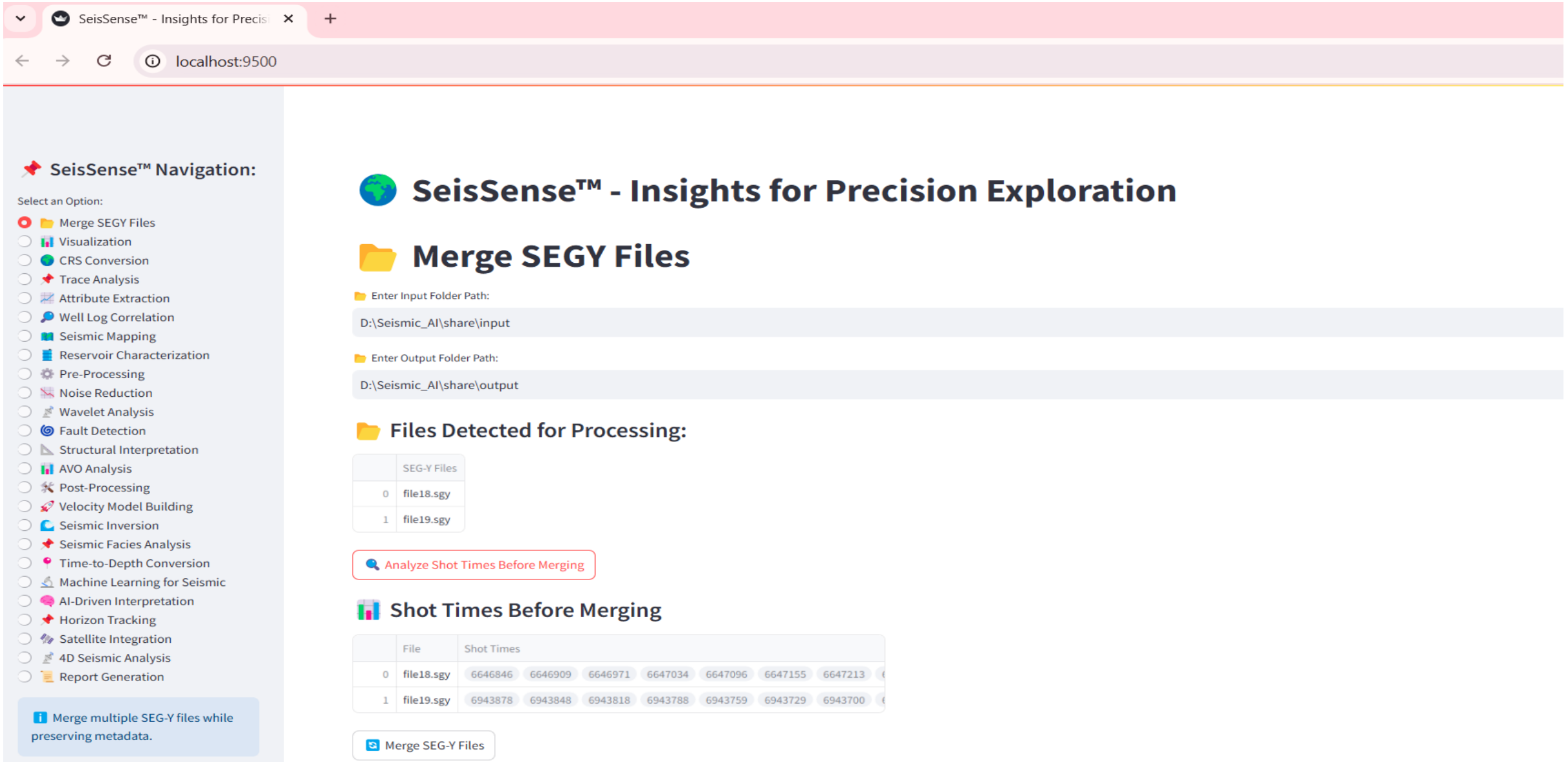
Validate continuity across multiple SEG-Y files.

Key Features of SeisSense™

- Automated Header Parsing & Correction
- Dynamic CRS Transformation Support
- Customizable Trace Merging Algorithms
- Scalability for Large Datasets
- Interactive Visualization & AI-Driven Quality Control
- Minimizing Data Loss During Merging
- Verification Techniques for Quality Assurance
- Memory Optimization for Large SEG-Y Files

Comparison with Traditional SEG-Y Merging Methods

Feature	Traditional Merging	SeisSense™ Merging
Header Standardization	Manual	Automated
CRS Correction	Limited	Full Support
Large Dataset Handling	Time-Consuming	Optimized & Scalable
AI-Driven Quality Control	None	Integrated
Merging Accuracy	Prone to errors	High Precision
Post-Merge Reporting	Basic Logs	Full Visualization & Analytics



📌 SeisSense™ Navigation:

Select an Option:

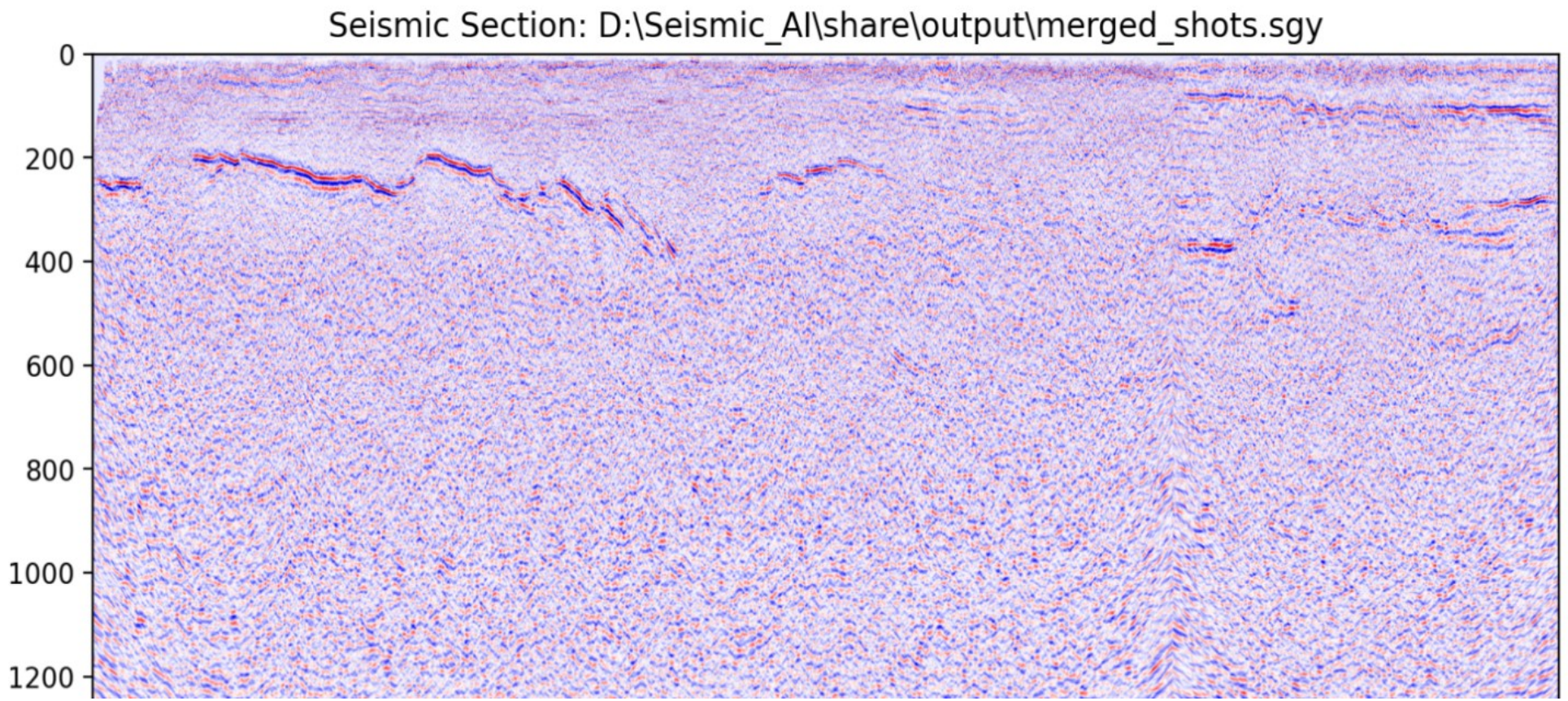
- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

ℹ Graphical representation of seismic traces and attributes.

SeisSense™ - Insights for Precision Exploration

Visualization

Visualize Merged File



Deploy

SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Analyze seismic traces for noise patterns, gaps, and inconsistencies.

Trace Analysis

Analyze individual traces from the merged SEG-Y file.

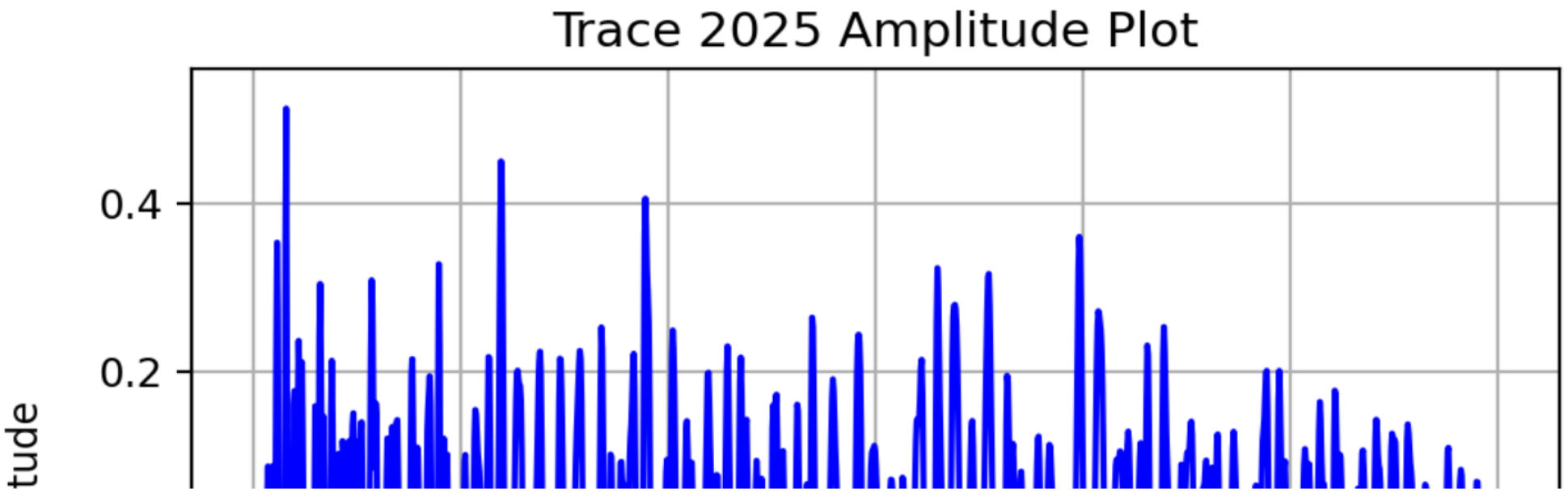
Select Trace Number

2025

0 6735

Trace 2025 Statistics:

- **Min Amplitude:** -0.41
- **Max Amplitude:** 0.51
- **Mean Amplitude:** -0.00



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Extract important seismic attributes such as RMS amplitude, variance, etc.

Attribute Extraction

Extract key seismic attributes such as amplitude, phase, frequency, and coherence.

Select Attribute Extraction Method

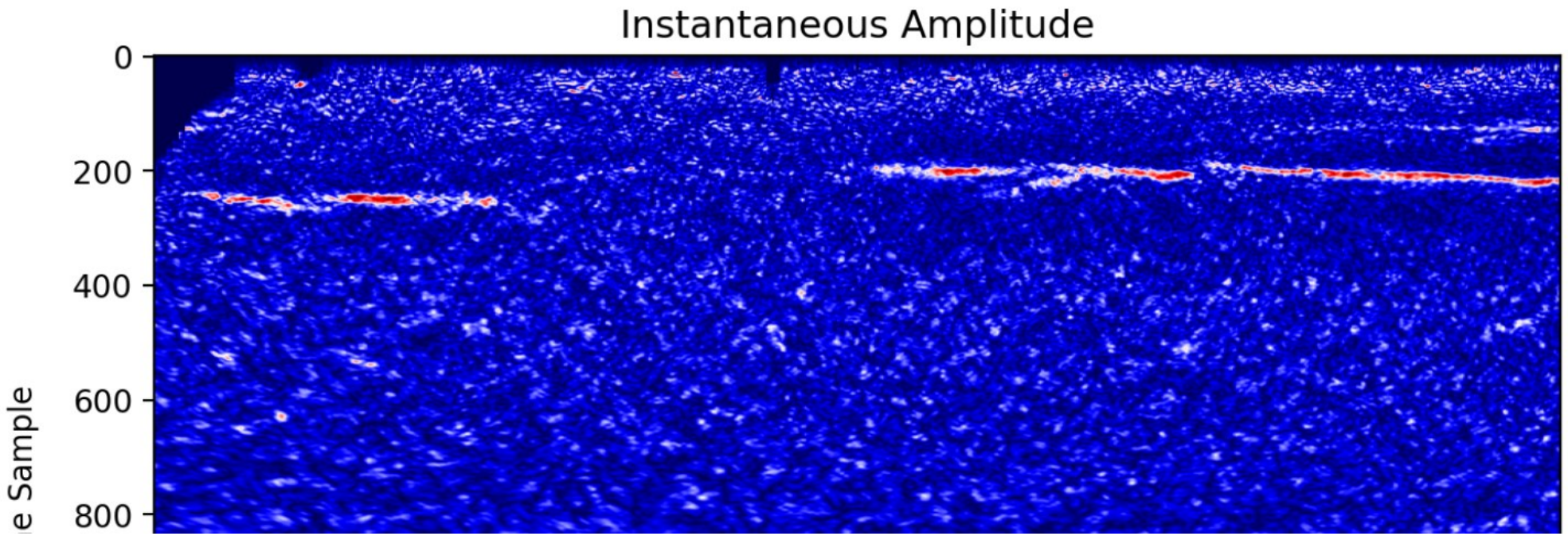
Choose Seismic Attribute

Instantaneous Amplitude

Select Trace Range

0 910

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

AI-powered analysis of reservoir properties for better exploration.

Reservoir Characterization

Analyze seismic data to estimate reservoir properties such as porosity, permeability, and water saturation.

Select Reservoir Property to Analyze

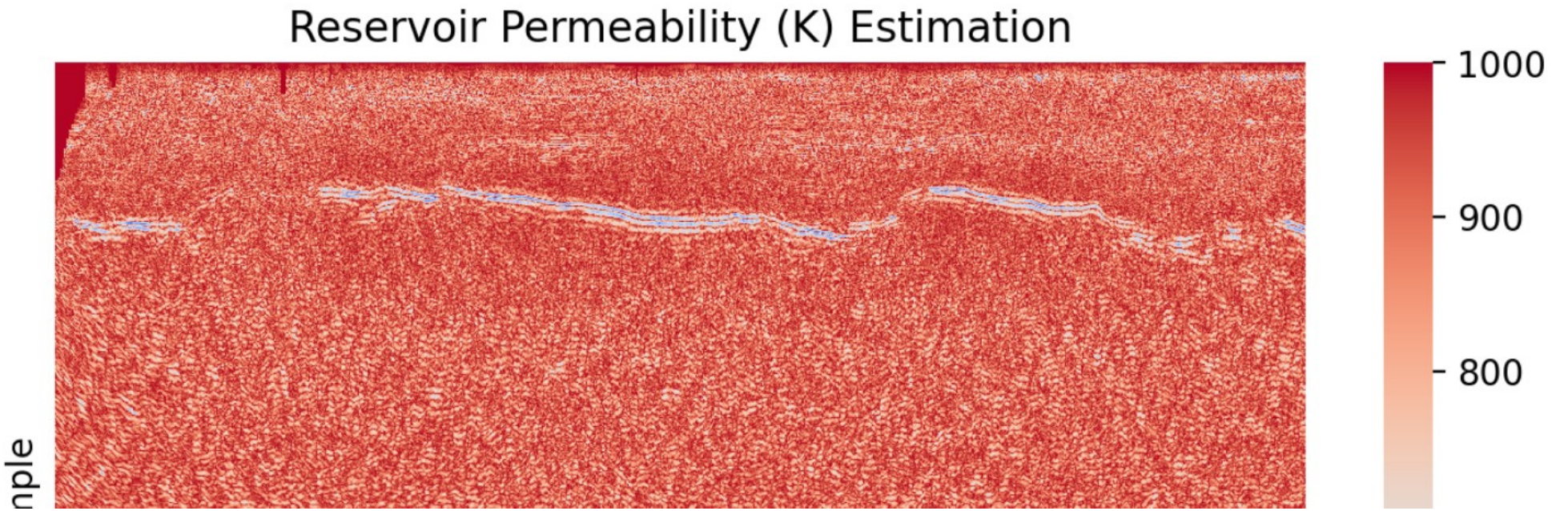
Choose Property

Permeability (K)

Select Trace Range

0 2195

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Prepare seismic data by applying filters and corrections before interpretation.

Select Pre-Processing Method

Choose Pre-Processing Method

Bandpass Filtering

Select Trace Range

0 2195

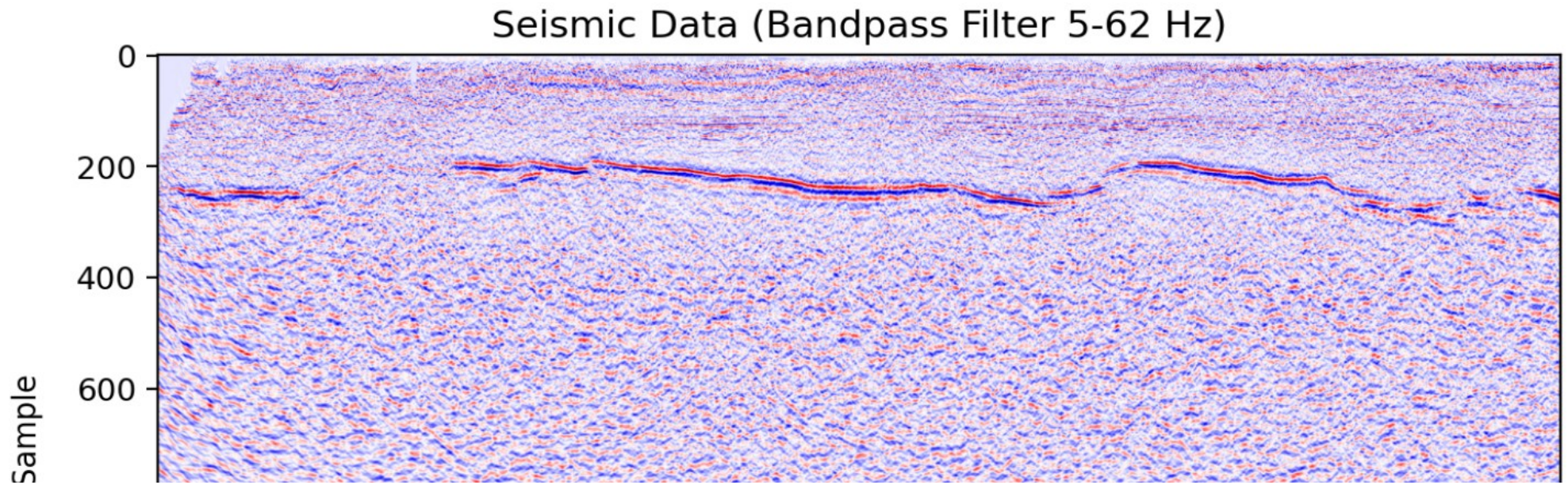
0 6735

Low Cut Frequency (Hz)

5

High Cut Frequency (Hz)

62



Deploy

SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Denoise seismic data using advanced filtering techniques.

Select Noise Reduction Method

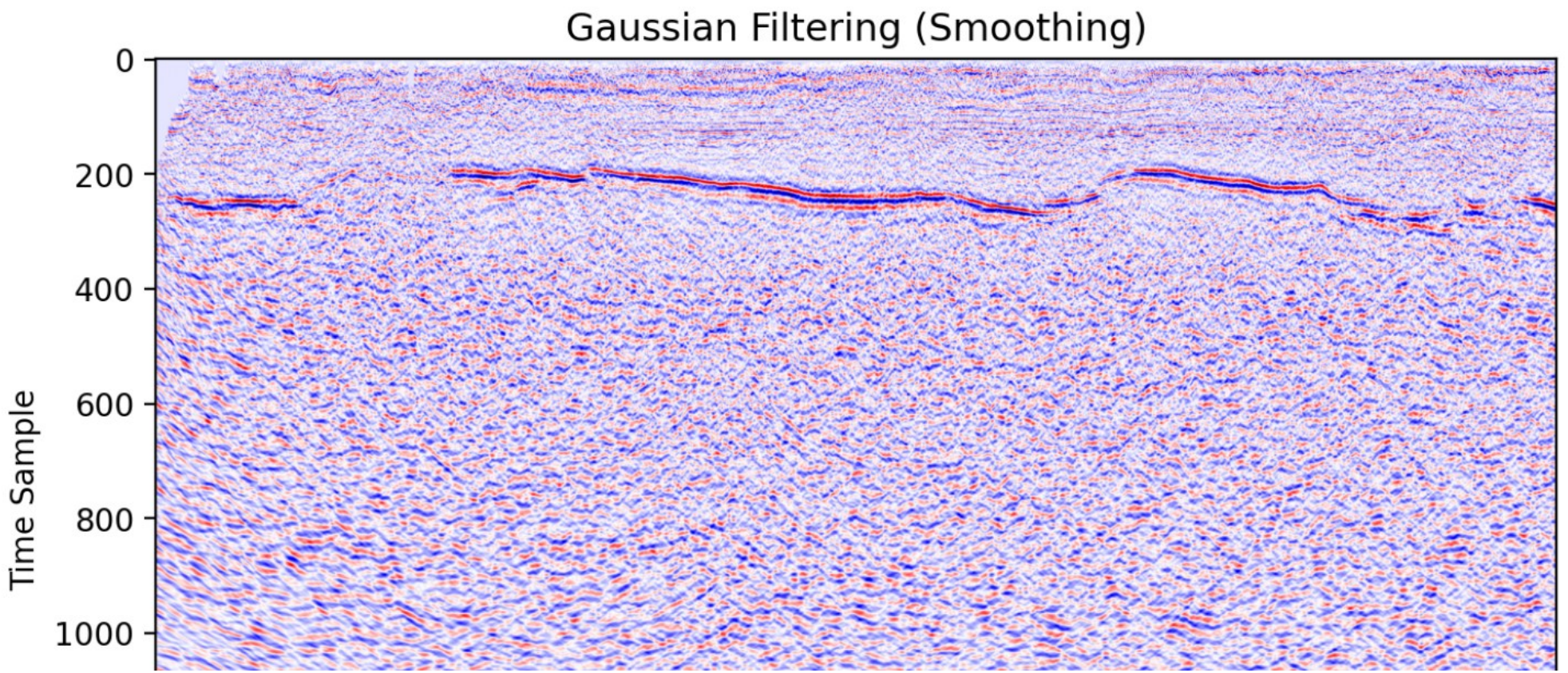
Choose Noise Reduction Method

Gaussian Filtering

Select Trace Range

0 2195

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- **Wavelet Analysis**
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

ℹ Study seismic wavelets to improve seismic resolution and interpretation.

Wavelet Analysis

Perform wavelet-based analysis on seismic traces for signal decomposition and filtering.

Select Wavelet Type & Parameters

Choose Wavelet Transform

Continuous Wavelet Transform (CWT)

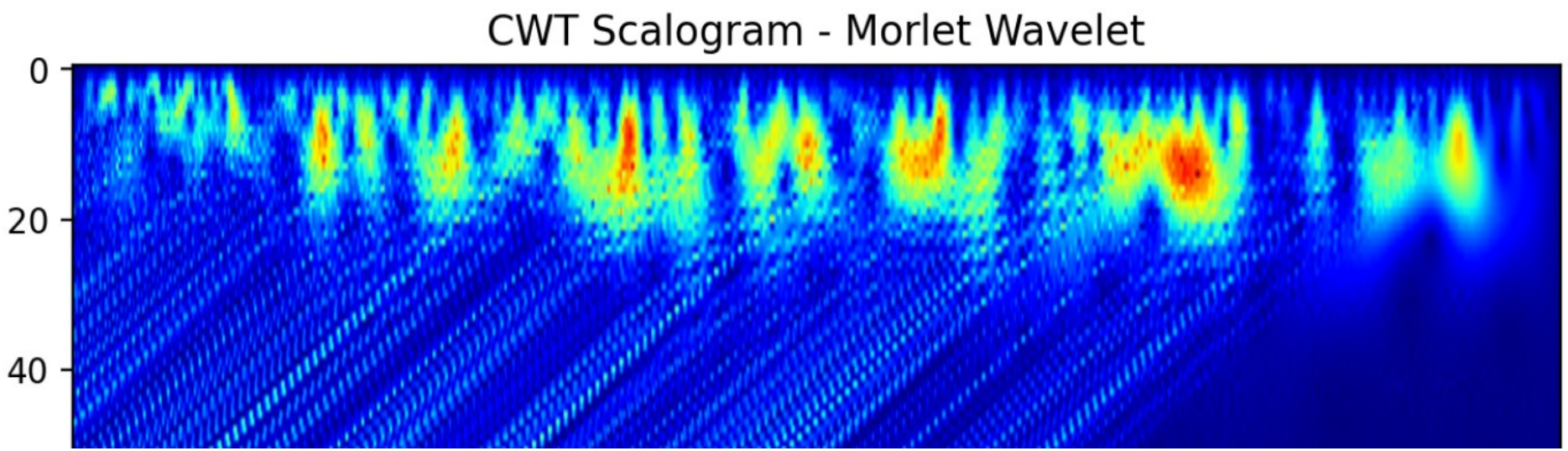
Select Wavelet

Morlet

Select Trace Number

1437

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- **Fault Detection**
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

AI-based fault detection using edge detection and deep learning models.

SeisSense™ - Insights for Precision Exploration

Fault Detection

Identify fault structures using Edge Detection and Deep Learning (U-Net CNN).

Select Fault Detection Method

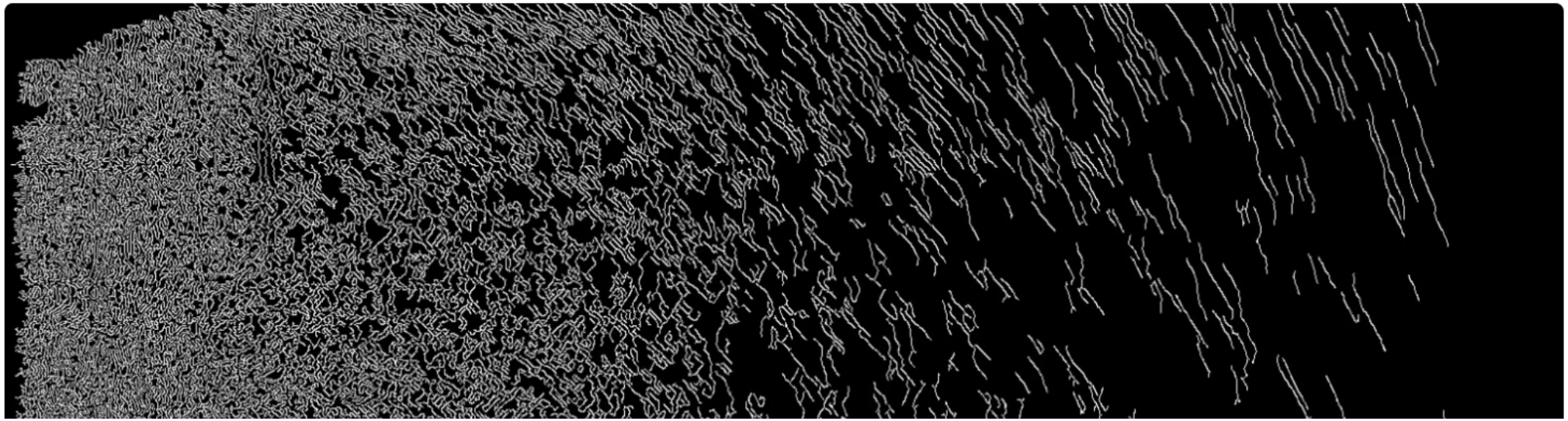
Choose Method

Canny Edge Detection

Select Trace Range

0 3013

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- **Structural Interpretation**
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Interpret structural features like folds and faults in seismic data.

SeisSense™ - Insights for Precision Exploration

Structural Interpretation

Analyze seismic structures such as faults, folds, and stratigraphic features.

Select Structural Interpretation Method

Choose Structural Interpretation Method

3D Structural Visualization

Select Trace Range

0 1550

0 6735

3D Structural Visualization

SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Final corrections and enhancements on seismic data before analysis.

Post-Processing

Enhance seismic data quality through filtering, normalization, and smoothing.

Select Post-Processing Method

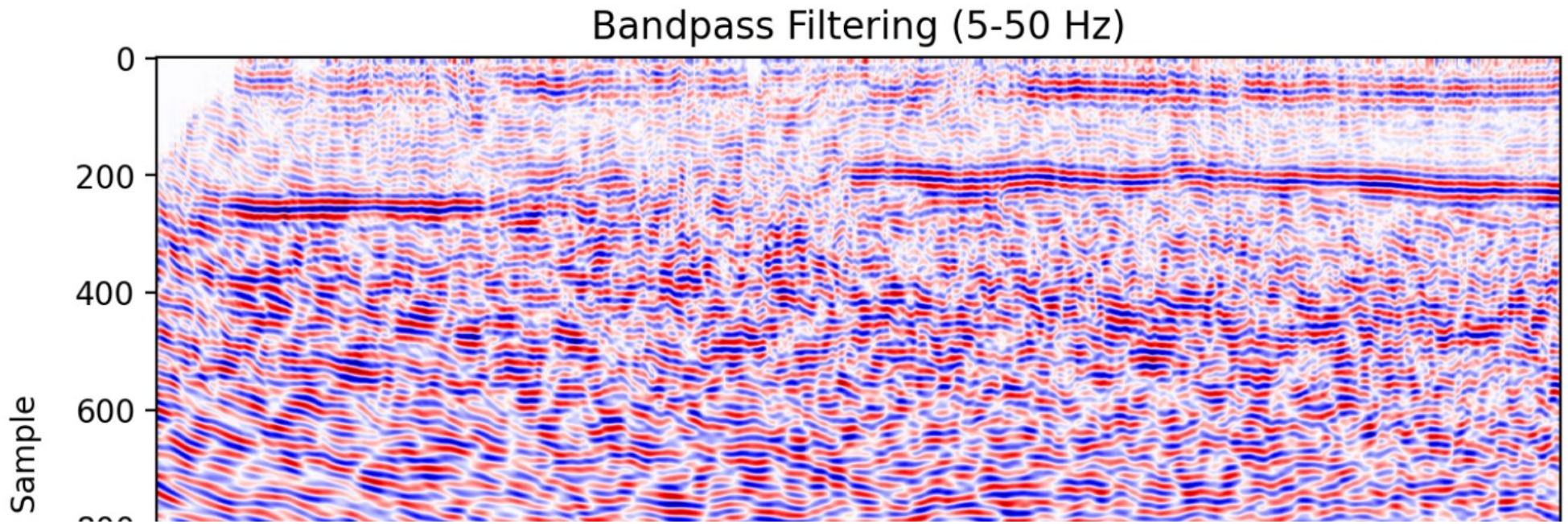
Choose Post-Processing Method

Bandpass Filtering

Select Trace Range

0 941

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Build velocity models for seismic depth conversion and migration.

Velocity Model Building

Compute and visualize interval and layer-based velocity models from seismic data.

Select Velocity Model Type

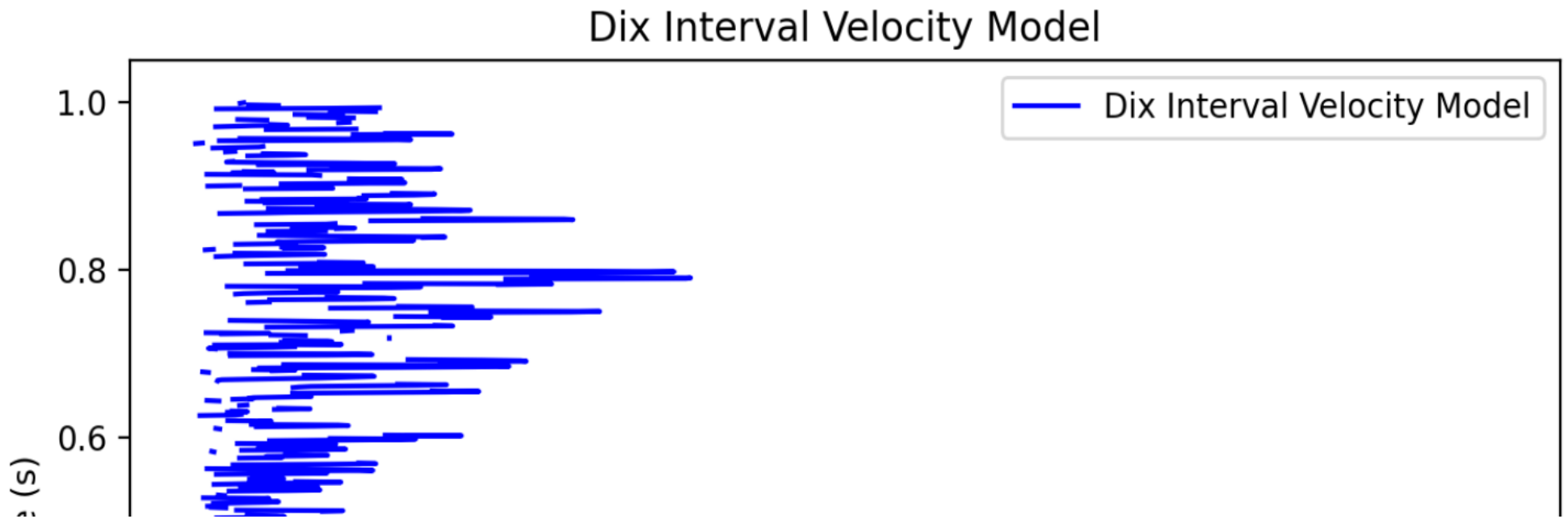
Choose Velocity Model Method

Dix Interval Velocity

Select Trace Range

0 1785

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Convert seismic reflection data into quantitative rock property models.

Seismic Inversion

Perform seismic inversion techniques to estimate subsurface properties from seismic traces.

Select Inversion Type

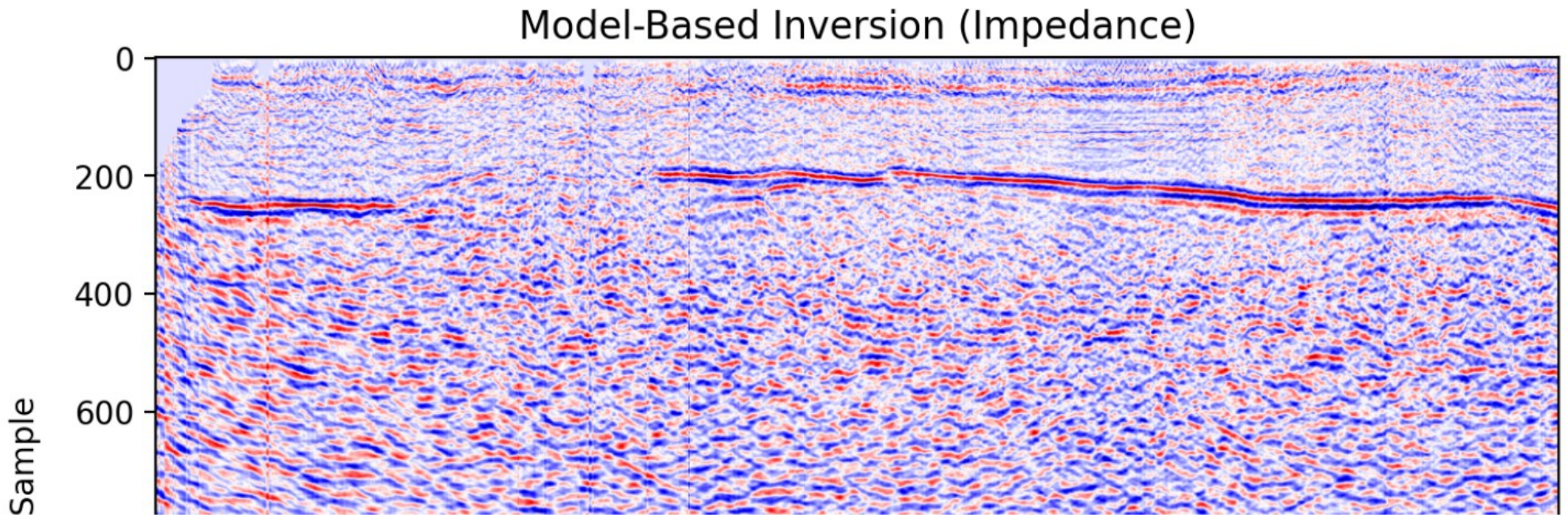
Choose Seismic Inversion Method

Model-Based Inversion

Select Trace Range

0 1298

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- **Seismic Facies Analysis**
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- Horizon Tracking
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Classify seismic facies using AI and machine learning techniques.

Seismic Facies Analysis

Classify seismic facies using AI-based clustering and PCA.

Select Facies Analysis Method

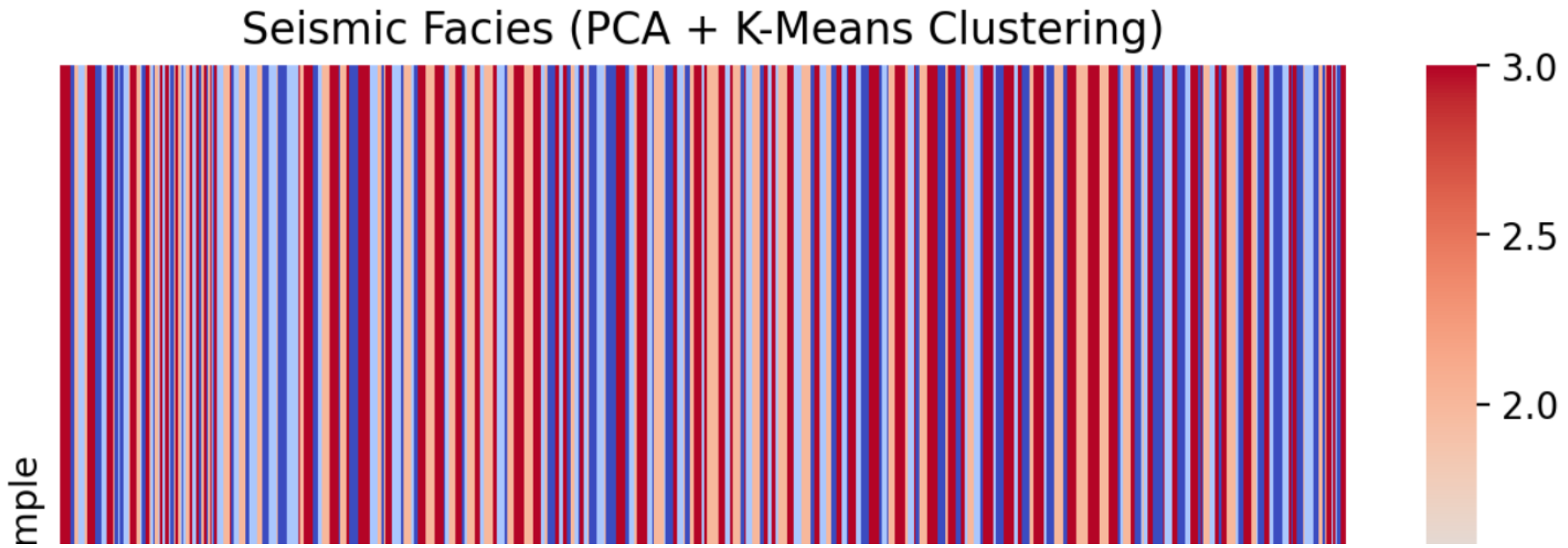
Choose Facies Classification Method

PCA + K-Means Clustering

Select Trace Range

0 1080

0 6735



SeisSense™ Navigation:

Select an Option:

- Merge SEGY Files
- Visualization
- CRS Conversion
- Trace Analysis
- Attribute Extraction
- Well Log Correlation
- Seismic Mapping
- Reservoir Characterization
- Pre-Processing
- Noise Reduction
- Wavelet Analysis
- Fault Detection
- Structural Interpretation
- AVO Analysis
- Post-Processing
- Velocity Model Building
- Seismic Inversion
- Seismic Facies Analysis
- Time-to-Depth Conversion
- Machine Learning for Seismic
- AI-Driven Interpretation
- **Horizon Tracking**
- Satellite Integration
- 4D Seismic Analysis
- Report Generation

Automatically track seismic horizons across datasets.

Horizon Tracking

Automatically and manually track seismic horizons.

Select Horizon Tracking Method

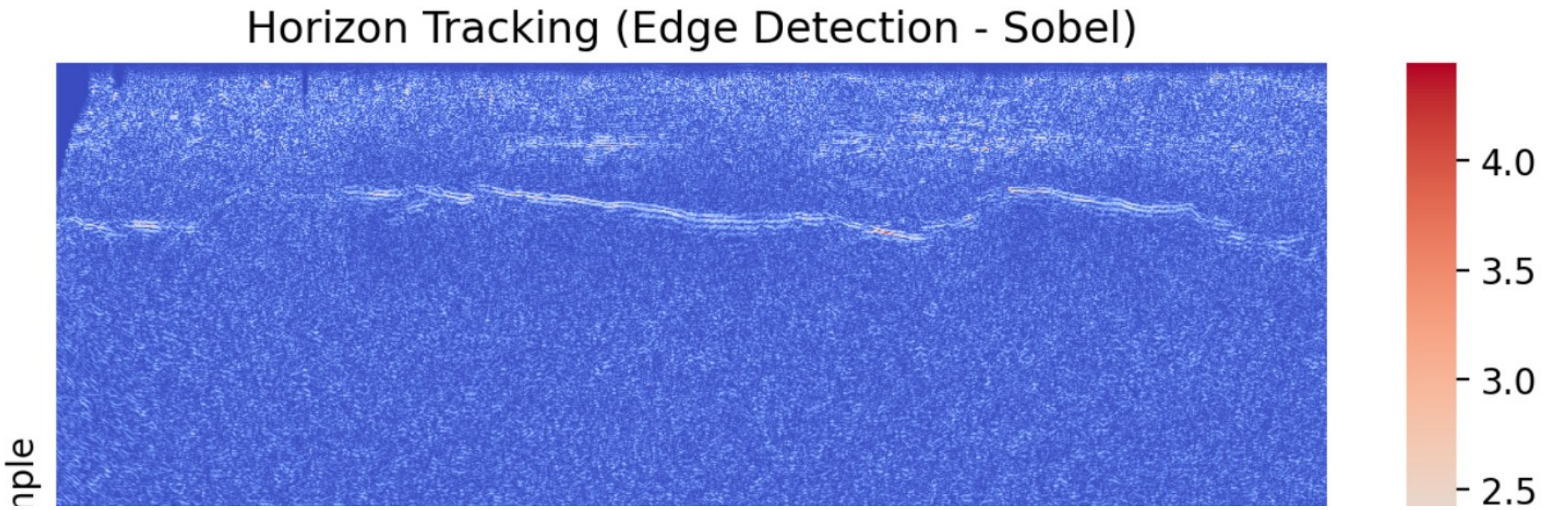
Choose Horizon Tracking Method

Edge Detection (Gradient-Based)

Select Trace Range

0 2047

0 6735



Applicable Use Cases of SeisSense™

Oil & Gas Exploration	Geophysical Research & Academia	Reservoir Characterization	Environmental & Geohazard Analysis
• Integrating regional seismic surveys.	• Comparing historical and modern seismic data.	• Merging seismic cubes for detailed subsurface imaging.	• Earthquake prediction and hazard mapping.

Deployment & Integration

Deployment Options:	Cloud-based AI Processing. On-premise HPC Integration. Hybrid AI Model Deployment.
Integration Capabilities:	Connects with Petrel, OpendTect, DecisionSpace. Supports SEG-Y, LAS, and other geophysical formats. Custom APIs for seamless data ingestion.

Why Choose SeisSense™ SEG-Y Merging?

- **Automated Workflow:** Eliminates manual efforts in merging multiple seismic datasets.
- **Scalable Data Processing:** Handles large-scale SEG-Y files efficiently with optimized memory usage.
- **High-Precision Data Alignment:** Ensures trace continuity and seamless dataset integration.
- **AI-Driven Quality Control:** Detects inconsistencies, missing traces, and ensures data integrity.
- **Industry-Standard Compatibility:** Works seamlessly with Petrel, OpendTect, DecisionSpace, and other geophysical software.
- **Operational Efficiency:** Reduces data processing time by 50%, enhances integration accuracy, and optimizes seismic interpretation workflows.
- **Business Impact:** Reduces redundant data acquisition, improves exploration efficiency, and enhances decision-making in seismic data analysis.

At Greenojo, we are leading the next wave of Industrial AI, Agentic AI, & Generative AI, transforming industries with autonomous, intelligent, and scalable AI-driven solutions.

THANK YOU

sales@greenojo.com

Greenojo Consulting Private Ltd