

# VisualVoxat: An Interactive Tool for Multi-Volume Attribute Generation, Visualization and Analysis

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VisualVoxat is an interactive environment to generate, visualize and analyze 3-D/4-D seismic attributes. A unique feature of VisualVoxat is its interactivity. It allows users to quickly generate attributes of selected sections, slices, or horizons from a large data volume and visualize results immediately. This makes it possible to fine tune processing parameters before generating attributes of the whole data volume in a very efficient manner.

VisualVoxat can generate four types of attributes:

- Trace difference attributes: this include wave-form difference, semblance, and eigen attributes.
- Structural attributes: dip, dip-azimuth, and spatial frequency attributes
- Instantaneous attributes: instantaneous phase, amplitude, and frequency.
- 4-D attributes: the trace difference attributes of multiple 3-D volumes.

VisualVoxat also provides a few 3-D image filtering functions, such as min, max, and median filters. The window size of filtering kernel can be adjusted interactively.

VisualVoxat has both 2-D and 3-D visualization functions for multiple data volumes. One can compare sections, slices, horizons, or data volumes of multiple 3-D dataset side by side in neighboring windows whose cursor and scroll bars are synchronized in real-time.

A processing-flow editor is included in VisualVoxat so that users can interactively design a proper processing procedure, such as generating trace difference attributes after applying a median filtering by or from instantaneous attributes.

VisualVoxat includes several multivariate statistical analyses, such principal component and correlation analysis. This allows users to extract independent attributes for data interpretation and classification.

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