Analysis of Multi-dimensional Data using DataMiner

Capabilities

- Interactive plotting
- Interpretation software with effective media models for upscaling.
- Analysis software for crossplotting and facies classifications.
- Import photographs and ascii log or core data for comparison.

Theoretical developments aimed at understanding the consequences of heterogeneity are fairly well advanced, with an abundance of effective medium theories for various properties being available. However, data collection detailing heterogeneity in physical properties is notably lacking, making it difficult to make use of these theories. The ability to combine measurements of heterogeneity of multiple properties in a single apparatus, and in some cases at the same time, greatly enhances the value of any one such measurement. Knowledge of how heterogeneities in different properties correlate spatially with one another will be helpful in developing interpretations of what controls each property. For example, permeability variations can be influenced by clay content, degree of cementation, porosity, grain size, and grain packing variations. In any given rock, many of these processes may be active and may be either correlated or uncorrelated with each other. Unraveling these dependencies can be important for many applications, such as assessing the potential of enhanced recovery methods in a given formation.

NER's **DataMiner** data analysis package offers support for handling and interpreting the AutoScan data. The analysis software option provides a package implementing effective media models for upscaling measured properties (i.e. predictions of log scale resistivity, permeability tensors, and scaling of seismic response using traditional volume averaging approaches). In addition, the analysis package provides links to NER's Pore Structure Inversion (**PSI**) software and **AutoLab** data files, providing ties to laboratory data collected and analyzed using NER's equipment and software product line.

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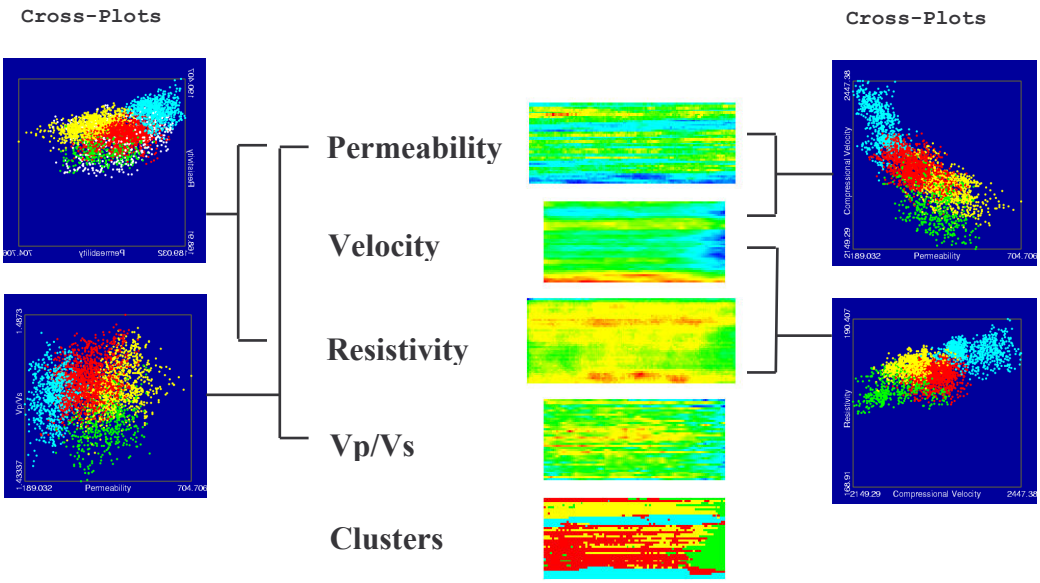
Cluster Analysis:
Identifying Facies and Length Scales



Using NER's *DataMiner* software, permeability, velocity, and resistivity maps can be analyzed to build petrophysical and/or geostatistical models of the observed heterogeneity. In this example, geostatistical cluster analysis is used to find regions of the sample that are petrophysically similar.

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