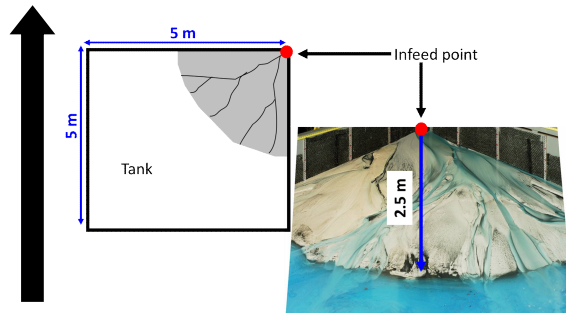




Integration of Experimental Data for Reservoir Modeling

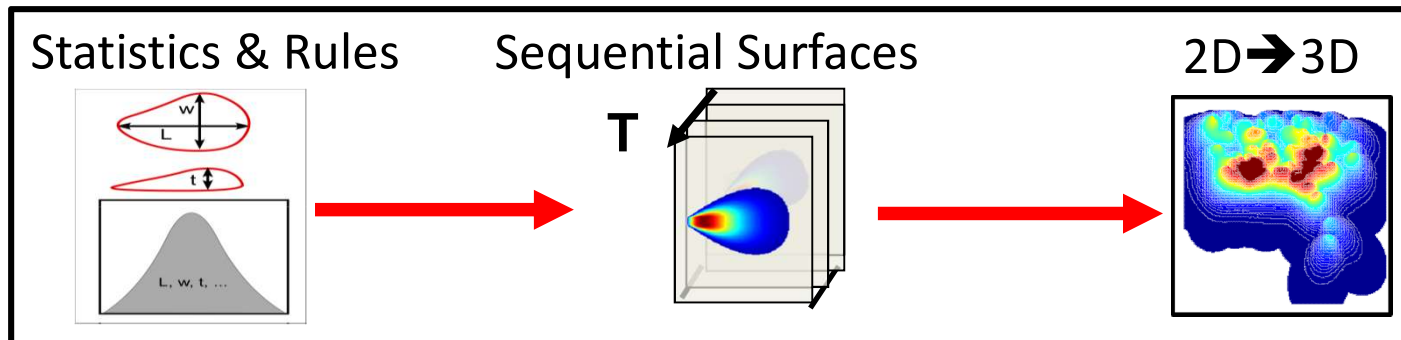
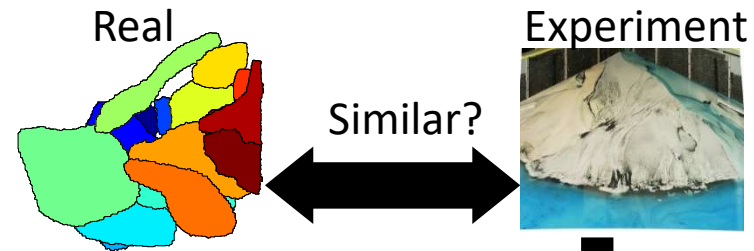
1. What data?

- Experimental Images



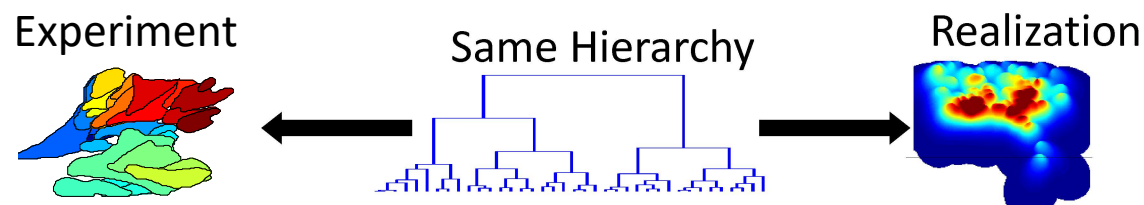
2. Which experiment for a reservoir?

- Testing Statistical Similarity



3. How to make the appropriate algorithm?

- Simulating Hierarchies of Geological Sequences

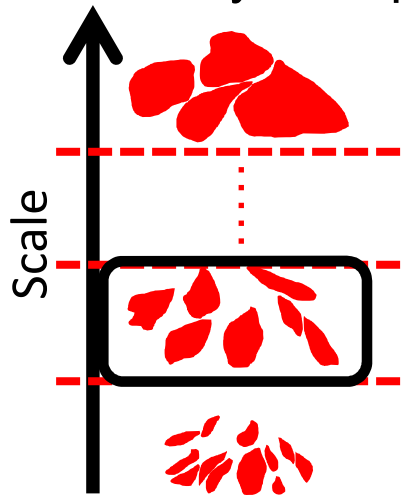




Integration of Experimental Data for Reservoir Modeling

Scale-dependent Pattern Similarity Analysis

Hierarchy of Experimental Lobes

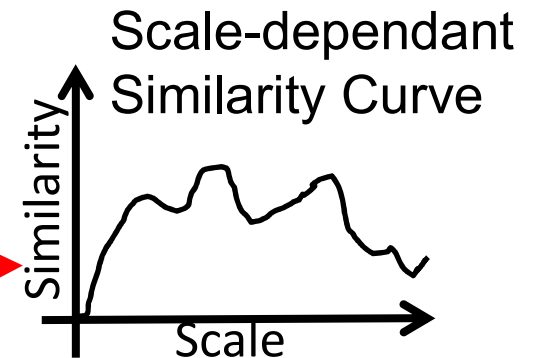


Test Similarity

Real Lobes

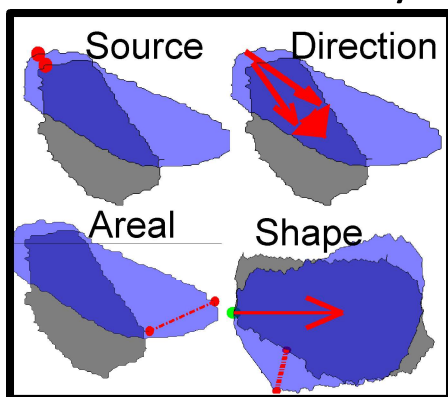


Saller et. al. 2008

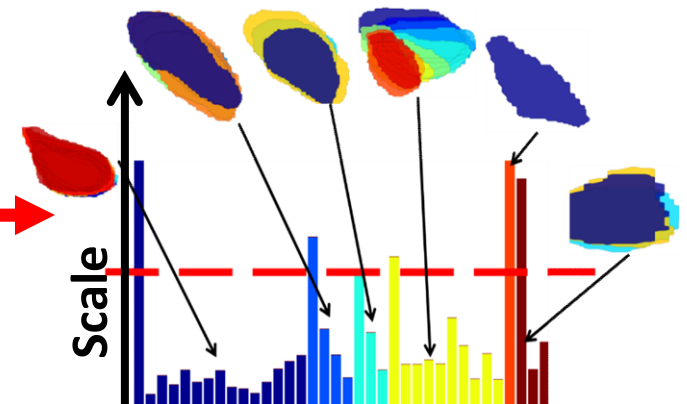
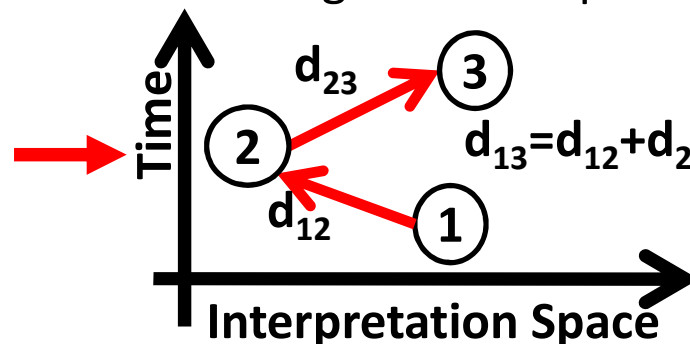


Challenge 1: Automatize Lobe Interpretation at Various Length Scales

Lobe Dissimilarity



Clustering on the Sequence

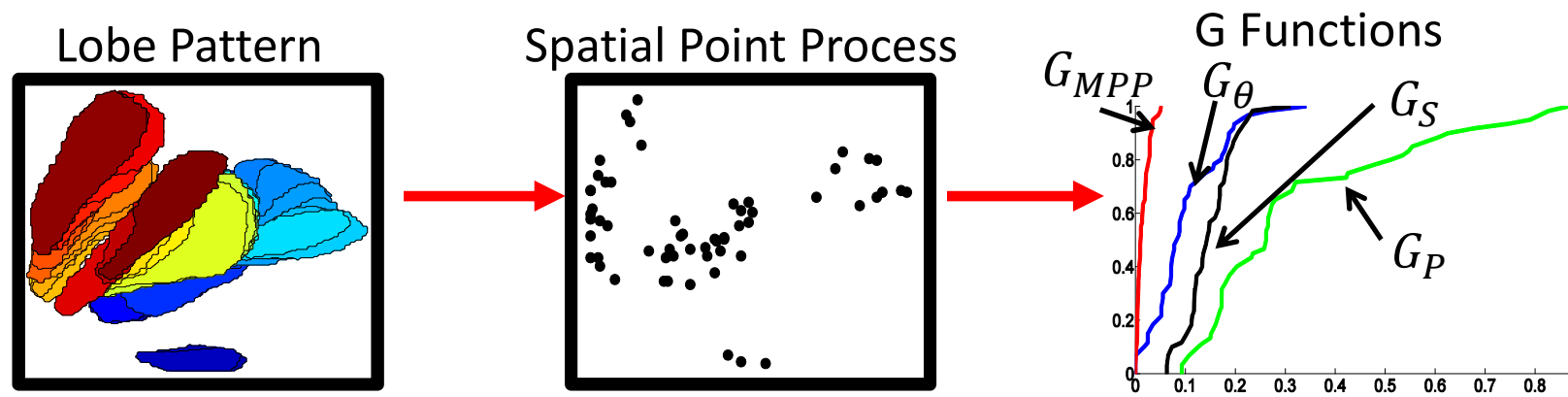




Integration of Experimental Data for Reservoir Modeling

Challenge 2: Quantify Geological Similarity

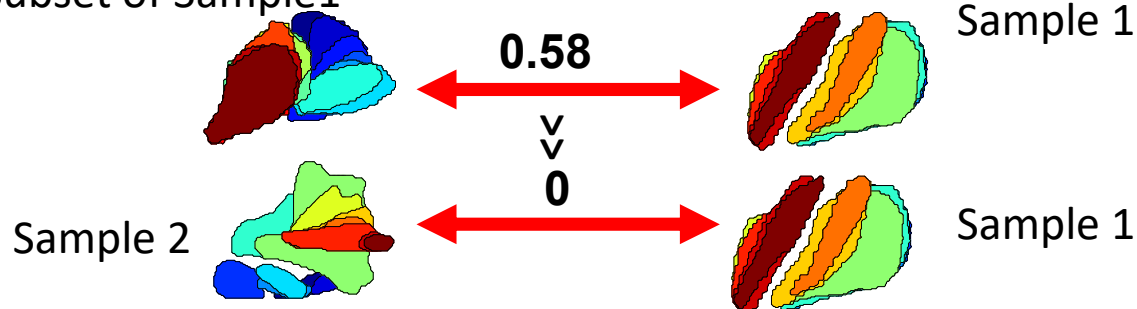
- Quantify Lobe Patterns → G Functions



- Compare Lobe Patterns

- Non-parametric 2-Sample Hypothesis Test (Efron & Tibshirani 1994): High p-value indicates less confidence on rejecting that two groups are the same

Subset of Sample1



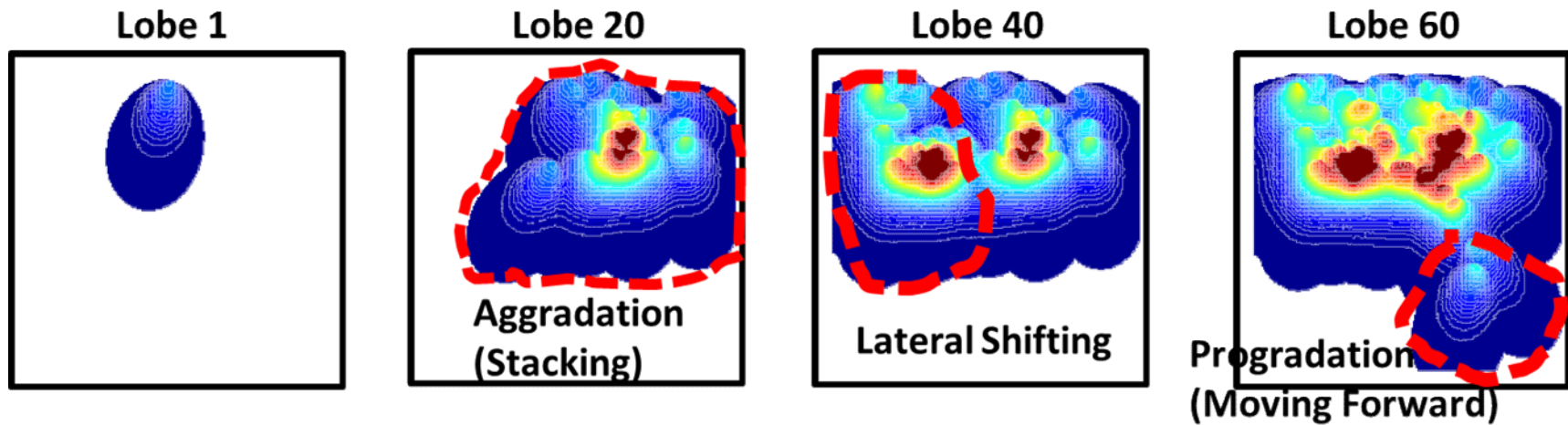
- Demonstrated on two experiments vs. a Boneo deepwater fan and a fraction of Amazon fan, and built an algorithm to control the hierarchy



Integration of Experimental Data for Reservoir Modeling

Challenge 3: Simulating Lobe Hierarchies

- Reproduce Geological Process (Qualitative)



- Control Lobe Hierarchies (Quantitative)

