Visualization and Exploration of High Dimensional Data

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Goals:
- multi-scale exploratory analysis of scalar functions
- understand relationship between input parameters and output
- interactively differentiate features from noise

Tools:
1. Morse-Smale Complex
2. Persistence simplification

Statistical Summary
- statistical and geometric information
- left column describes statistical summary
- right column encodes gradient information

Parallel Coordinate Plots
- each dimension is a vertical line
- illustrates relation among input parameters in high-d

Topological summary
- Morse-Smale Approximation
- Geometric Summary
- Dimensionality Reduction
- width of tube denotes spread of data
- luminance of tube denotes density of data

Interactive Projection
- users interactively manipulate labeled axes to determine how each axis is projected
- preserves intuition which is otherwise lost for black box projection techniques

Pairwise Scatter Plot
- pairwise comparison of features
- transparent tube denotes standard deviation
- difficult to construct in high-d

Inverse Coordinate Plot
- each input parameter is an inverse function of the output
- transparent grey tube denotes standard deviation