Interactive Visualization of GRT and BioHTS Data

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Introduction
The scope of this project is to provide better tools for statistical and informational visual analysis for High Throughput Screening of Biological Infectious Agents (BioHTS), General Recognition Theory (GRT) modeling, and areas where pipelines of unstructured datasets of all types must be analyzed. A parallel coordinates plot is one of the more effective visualization methods for visualizing multi variant data.

Parallel Coordinates
Parallel coordinates plots are used to show a set of points in an n-dimensional space. It uses n parallel vertical axes. A point in n-dimensional space is represented as a poly-line with vertices on the parallel axes; the position of the vertex on the i-th axis corresponds to the i-th coordinate of the point [1]. In this project, the D3 [2] library was used to generate the plots. Based on established principles, such as parallel coordinates, these algorithms were amended specifically to the needs of the GRT and BioHTS researchers. The specific approaches are outlined in the following subsections.

Visualization of GRT Parameter Space Data
Instead of visualizing the IDCMs in their entirety, a clustering approach was developed that summarizes the IDCMs based on statistical methods, such as mean values and standard deviation, to reduce the dimensionality and make the data more manageable for visualization and perceptual purposes. This then allows the visualization of the IDCMs on just 16 axes, which means a significant reduction in complexity within the visualization.

References:
[1] Parallel Coordinates in Wikipedia.