Machine Learning
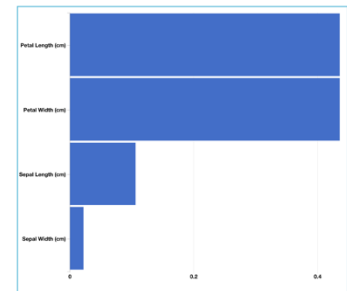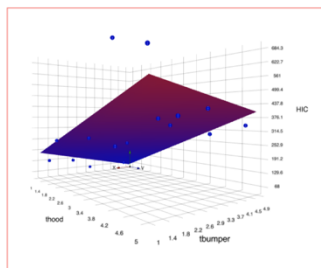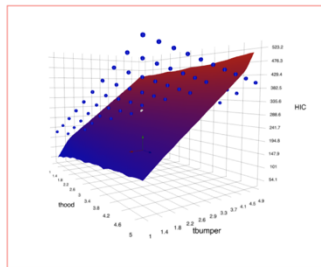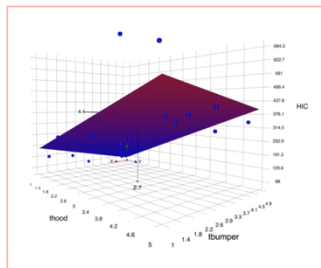
Learn and Predict Data to Make Better and Faster Decisions
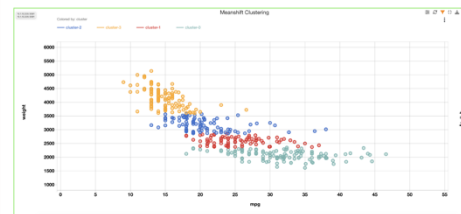
Data Exploration

We must dig deep to find insights in our data that reveal patterns and relational variables.

Advanced extraction, organization and visualizers play a major role in these discoveries.
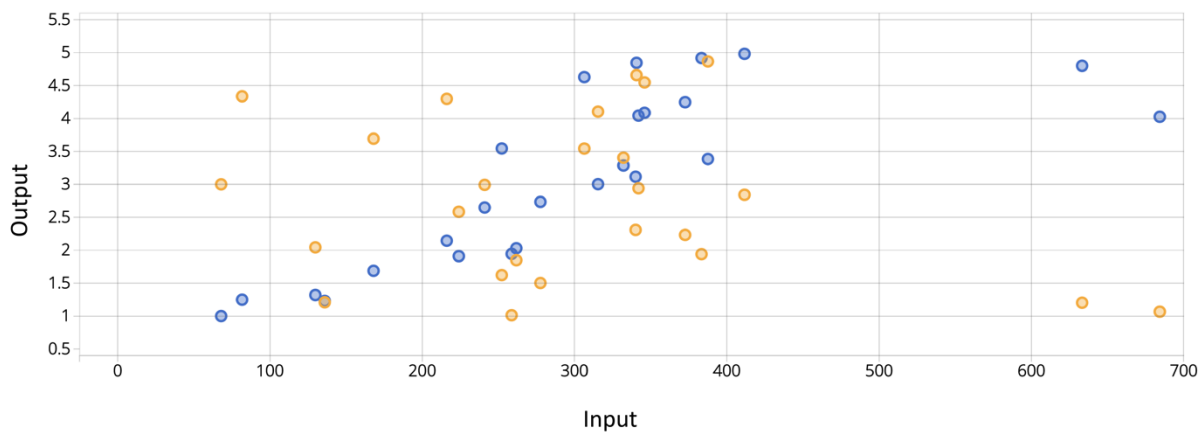

Figure 1: Output vs Input Scatter Plot

Machine Learning Models

d3VIEW currently has 16 machine learning models to utilize with even more to come.

Choose from the two supervised learning types, regression which predicts numerical values, and classification which predicts categorical values.

Or, choose the unsupervised learning type, clustering, which groups data points into clusters for a more generalized understanding of patterns in data.
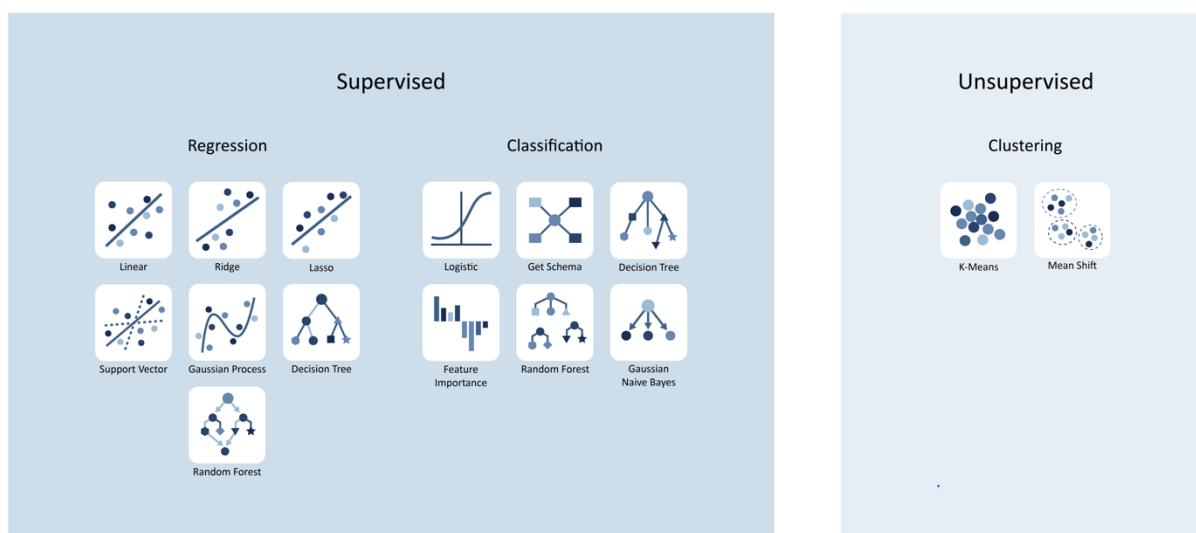

Figure 2: Machine Learning Models in d3VIEW

Predicting Head Injury Criteria from Pedestrian Impact Simulations

This example shows the use of linear, lasso and ridge regression ML models to predict HIC values based on hood and bumper thickness.

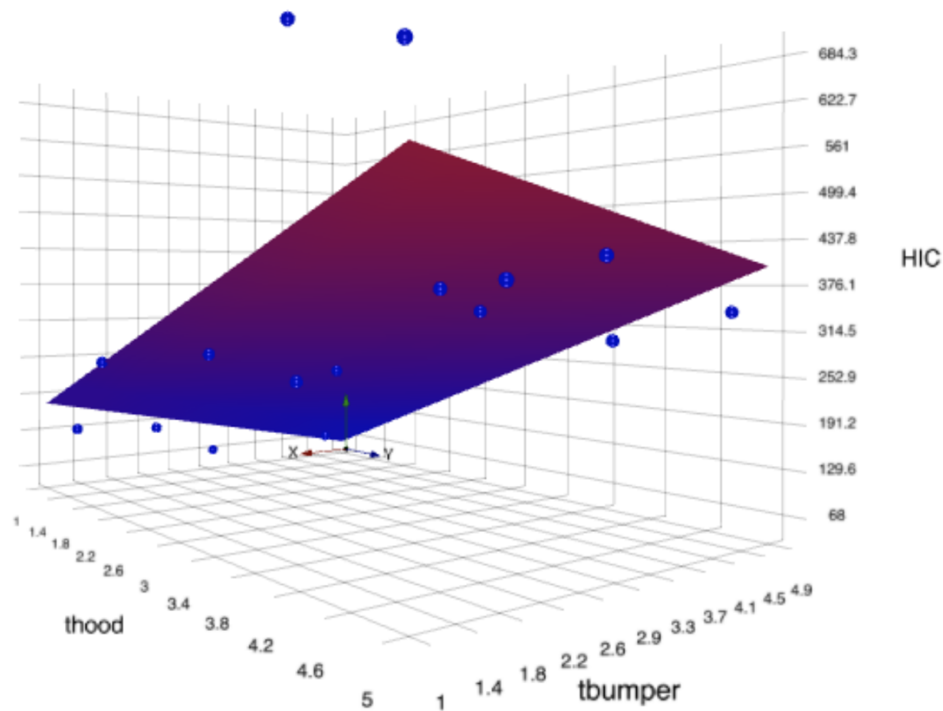These regression predictions illustrate their models as 3D scatter/surface plots.
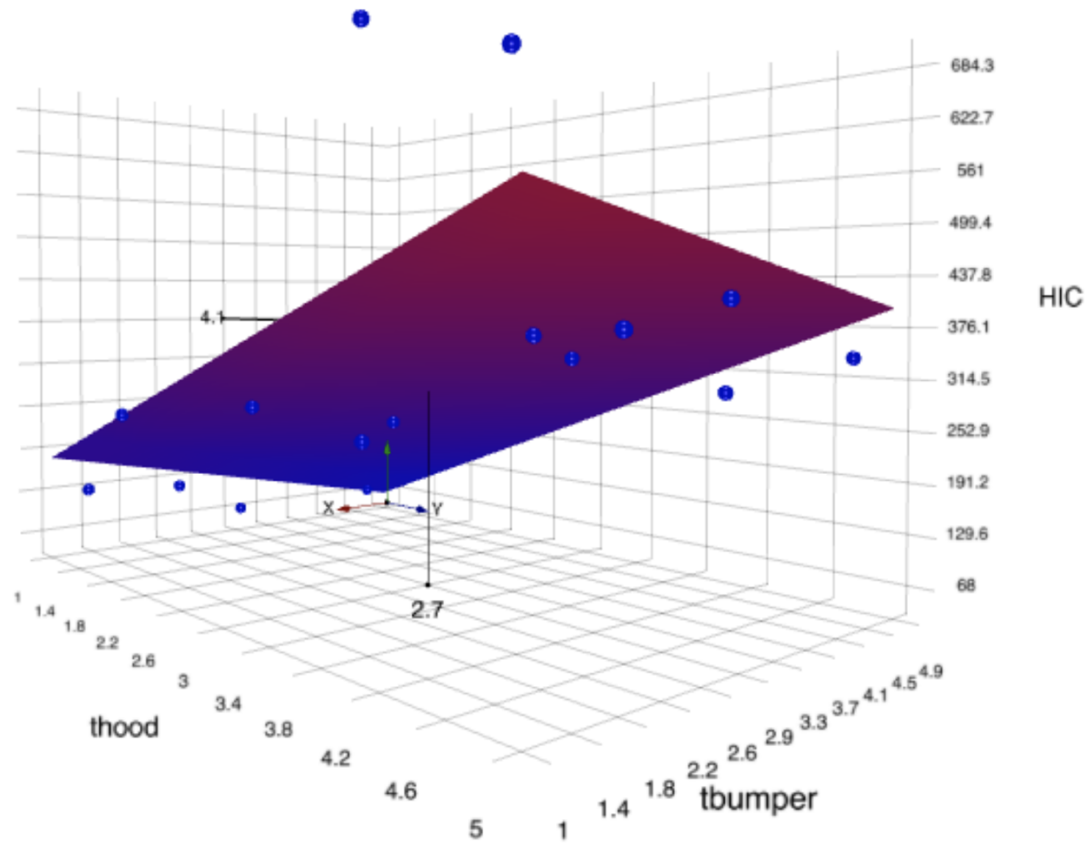

Figure 3: Linear Regression
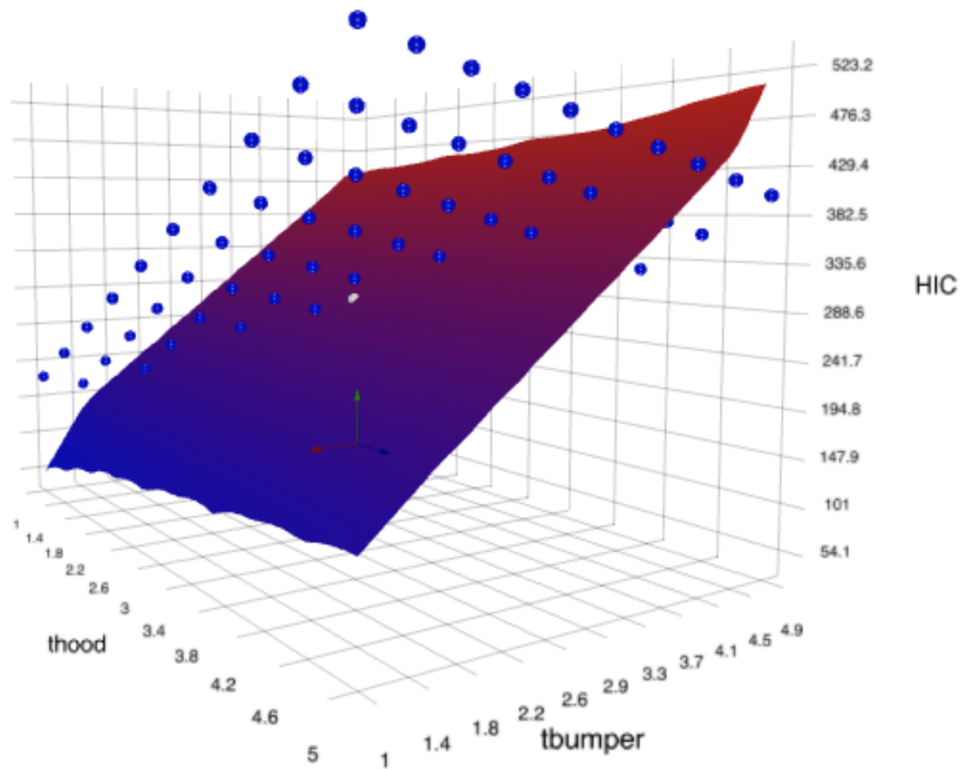
Figure 4: Lasso Regression

Figure 5: Ridge Regression

Using Prediction Models

Use the generated model to predict new points, as shown to the right using the HIC example from above.

Manually input single points or upload a CSV of multiple points to predict data based on the ML model.

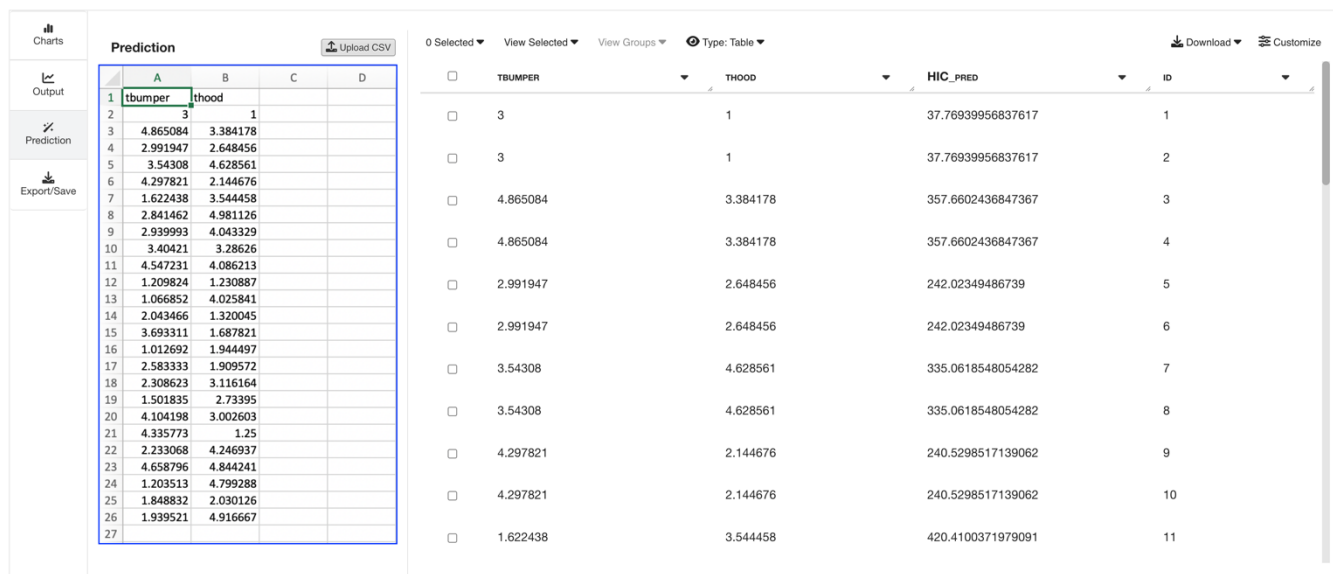Figure 6: Predict Point Manually

Figure 7: Predict Points From CSV

Predicting Iris Flower Species

This example shows the use of decision tree, random forest and feature importance classification ML models to predict flower class based on petal and sepal width and length.

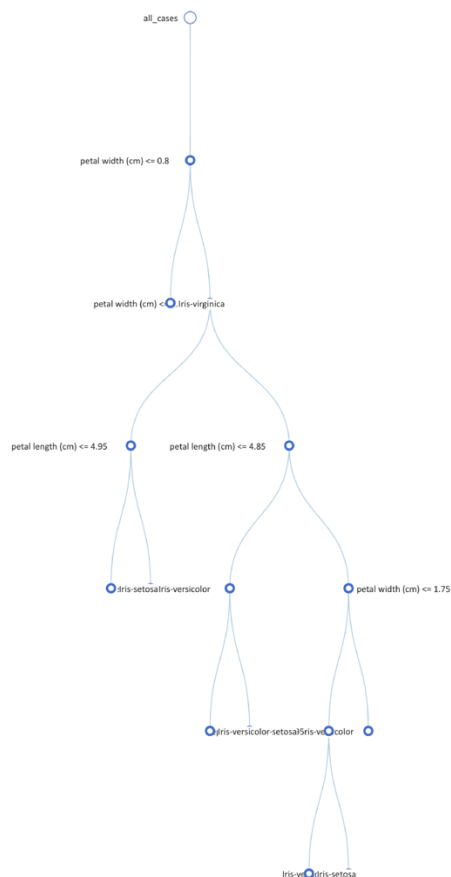These classification predictions illustrate their models as hierarchal data trees and horizontal bar charts.

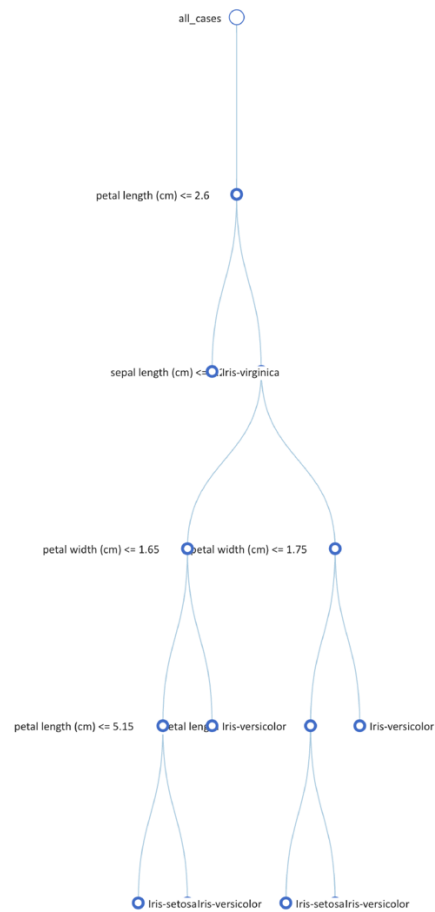Figure 8: Decision Tree Classifier
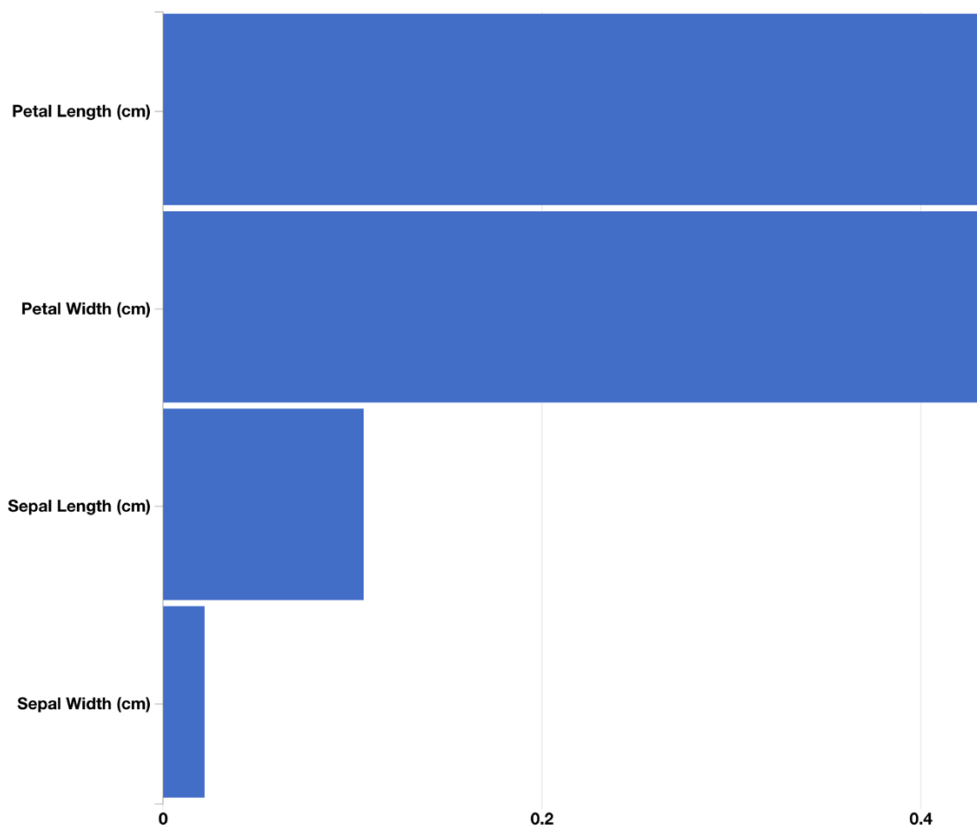
Figure 9: Random Forest Classifier

Figure 10: Feature Importance

Predicting Groups for Auto MPG and Weight

This example shows the use of k-means and mean shift clustering ML models to predict groups based on automobile miles per gallon and weight.

These regression predictions illustrate their models as scatter plots with k-means using indicated cluster amount and means shift using indicated cluster bandwidth for grouping.
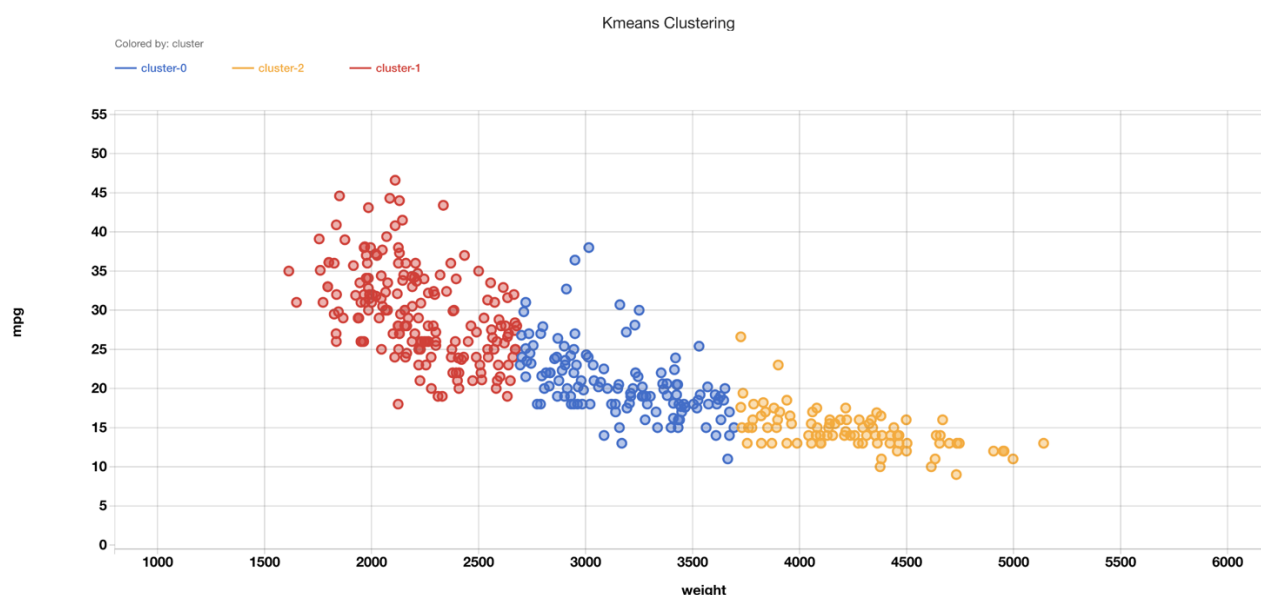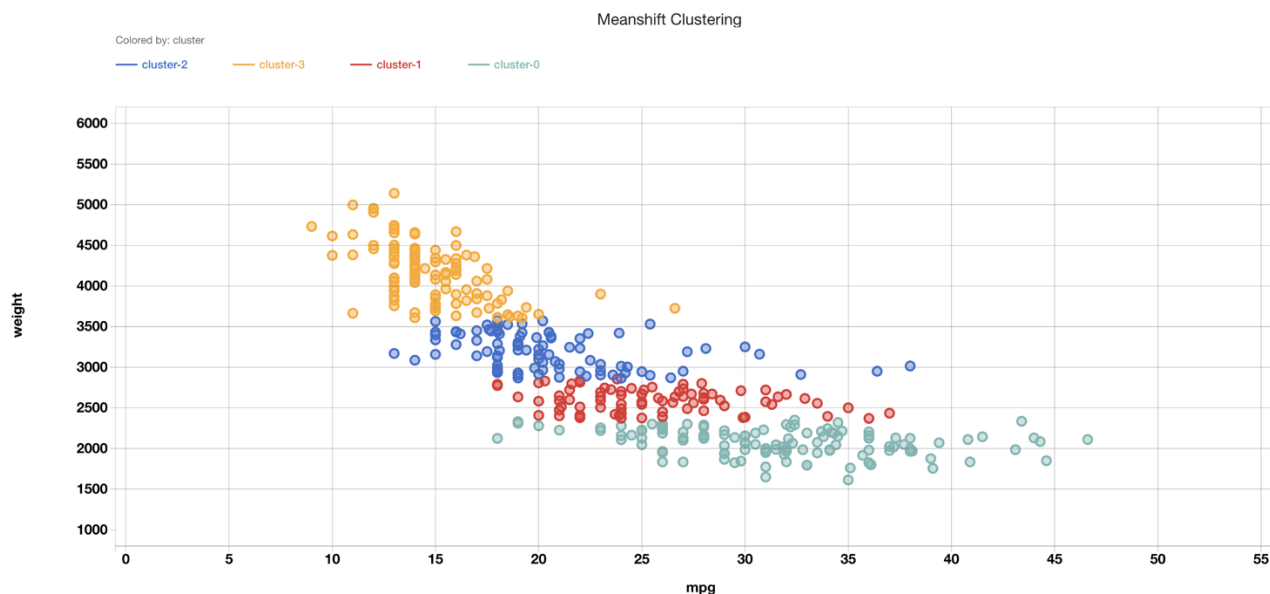

Figure 11: K-Means Cluster

Figure 12: Means Shift

ML App Integration

Currently, the main d3VIEW applications that can tap into these Machine Learning capabilities include HPC jobs, Simulations, Physical Tests, Databases, Workflows and Simlytiks®.
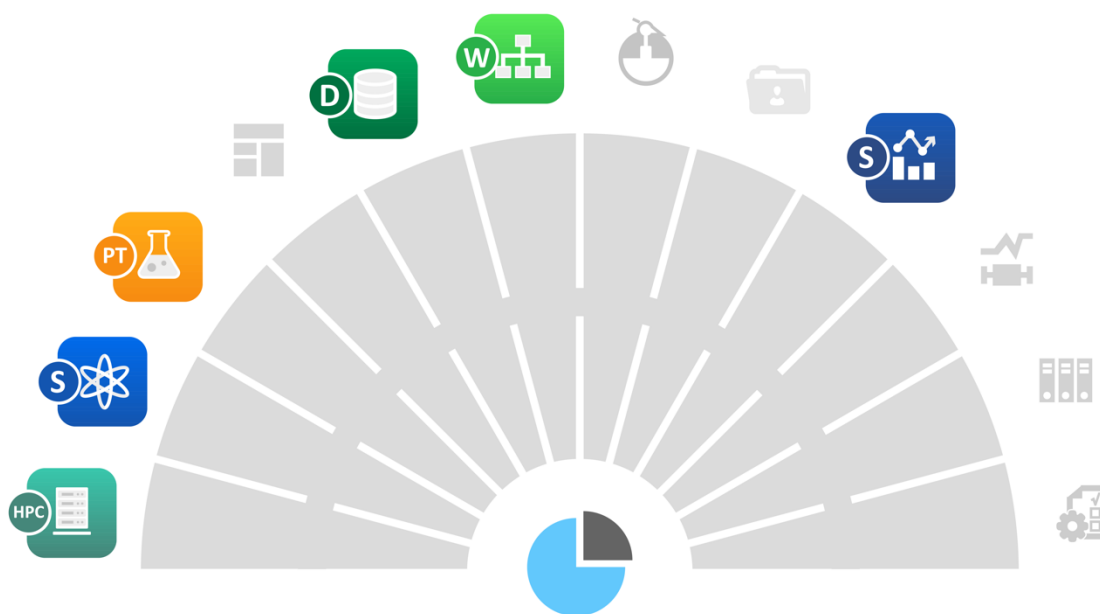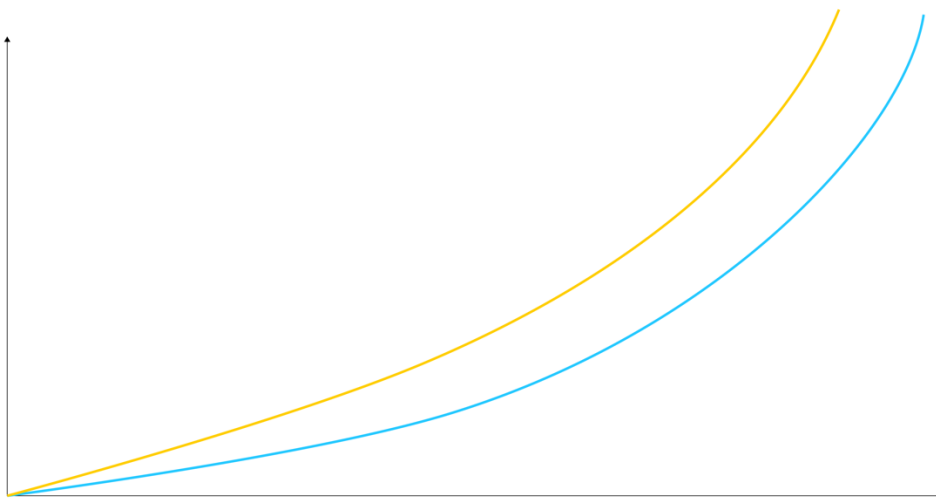

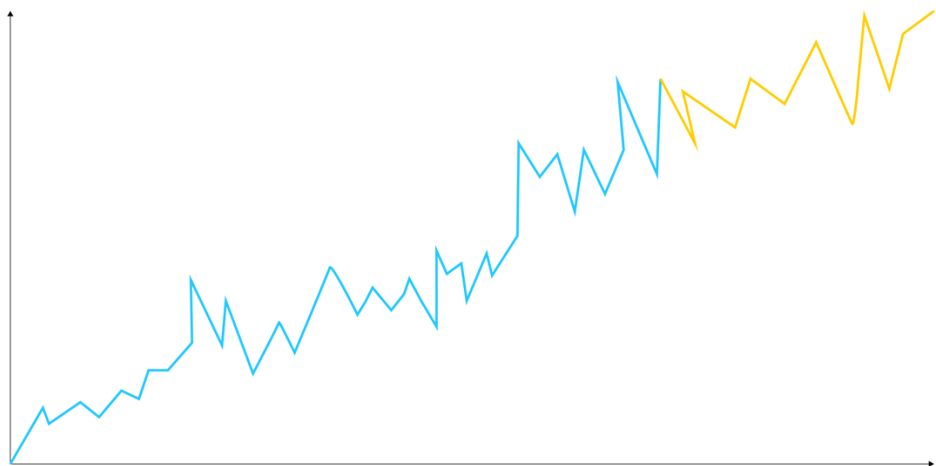Figure 13: Apps Integrated with Machine Learning in d3VIEW

More Machine Learning Possibilities

d3VIEW plans on incorporating more ML features to come which include but are not limited to:

- o Learn and predict curves
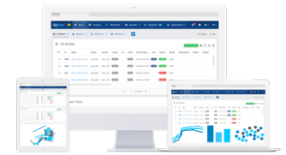

- o Time-series forecasting

o   Re-enforcement learning

o   Image classifications

To Learn More, Contact Us for a Live Demo!

www.d3view.com

support@d3view.com