

Chemical Threat Clustering Tool

POWERFUL CLUSTERING TOOL PROVIDES EASY TO USE ANALYSIS FOR THREAT CHEMICALS

The sheer number of toxic chemicals that could be used by terrorists prohibits a comprehensive, detailed analysis of each possible threat agent. The Chemical Threat Clustering Tool provides an efficient means of analyzing the exhaustive body of possible threats by identifying representative chemical exemplars for use in threat assessments. This tool uses a technically defensible, consistent, and repeatable process for determining how many exemplar threat chemicals are required to represent the exhaustive body of possible threats.

FOCUS ASSESSMENTS ON ONLY THE CHEMICALS NECESSARY TO CHARACTERIZE THE THREAT

The Clustering Tool answers the key questions:

- How many chemicals should be explicitly considered to assess threat?
- Which cluster of threat chemicals represents a particular chemical of interest?
- How does threat clustering change if there are new data about a chemical or if there are changes to chemical industry practices?

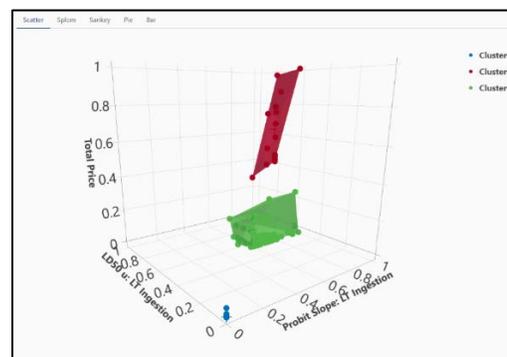


The Chemical Threat Clustering Tool Home Page

The Chemical Threat Clustering Tool provides the user with the capability to apply one of six clustering algorithms (K-Means, Gaussian Mixture Model, Mean Shift, Agglomerative Hierarchical, Fuzzy C-Means, or ordering points to identify the clustering structure [OPTICS]) using one of three dataset

transformations (range scaling, variance scaling, or principal component analysis) to any user-specified data set. The Clustering Tool allows the user to parse data by characteristics to find commonalities and prioritize the data. It reduces large sets of data into simplified visual formats that help decision making on relevance and data significance.

Results can be viewed interactively in a variety of 2-D and 3-D formats, including scatter plots, Sploms, Sankey charts, pie charts, and bar charts. Results can also be exported into a Microsoft Excel® format for subsequent analysis and reporting.



Three projected clusters determined by the Chemical Threat Clustering Tool based on chemical properties.

FLEXIBLE TO ADAPT TO OTHER CLUSTERING NEEDS

The Chemical Threat Clustering Tool is flexible. The Tool can be applied to any user-specified data set, such as potential targets, terrorist organizations, or other determinants.

INDUSTRY PARTNER

The Chemical Threat Clustering Tool is owned by the Department of Homeland Security Science and Technology Directorate and Battelle Memorial Institute is the performer for this task.