MEANDER - A Heuristic for Visualization of Exploratory Paths through High Dimensional Space

The MEANDER algorithm converts complex high-dimensional path data into simplified two-dimensional visual representations, allowing for easier analysis and comprehension of patterns across diverse data sets.

With the development of big data, visualization of data is seen as a key element in the overall process of extracting value from the 2.5 quintillion bytes of data that is created throughout the world each day. One such emerging area that could benefit from the analysis of this data is the Materials Genome Initiative, which was established to help businesses discover, develop, and deploy new materials at least twice as fast and at a fraction of the cost.

Researchers at Purdue University have developed an algorithm called MEANDER that produces two-dimensional data representations and graphic visualizations of paths that traverse distinct points in high-dimensional spaces. The resulting two-dimensional data can then be analyzed using a variety of planar data analysis programs that are incapable of working with high-dimensional space. This visualization can be both static images or animations and aid in the comprehension of patterns of behavior. MEANDER can be used in visualizing SQL queries, web and semantic searches, etc. This functionality is of growing importance as governmental and commercial entities emphasize informatics.

Advantages:

-Focuses on the paths through high-dimensional space rather than space as a whole

-Simplifies N-dimensional path data sets into two-dimensional data

Potential Applications:

-Data analysis

Technology ID
2014-DENN-66642

Category
Artificial Intelligence & Machine Learning/AI Model Optimization & Acceleration Tools
Materials Science & Nanotechnology/Advanced Functional Materials

Authors
Nathan Denny
Michael Zentner

Further information
Matt Halladay
MRHalladay@prf.org

Erinn Frank
EEFrank@prf.org

View online

-Data visualization

TRL: 3

Intellectual Property:

N/A, N/A, N/A

Keywords: MEANDER algorithm, high-dimensional visualization, N-dimensional path data sets simplification, two-dimensional data representation, graphic visualizations, planar data analysis, SQL query visualization, web search visualization, semantic search visualization, informatics, Algorithm, Analytics, Big Data, Computer Technology, Data Visualization, Visual Analytics