

Accepted Manuscript

High-Dimensional Data Visualization by Interactive Construction of Low-Dimensional Parallel Coordinate Plots

Takayuki Itoh, Ashnil Kumar, Karsten Klein, Jinman Kim

PII: S1045-926X(15)30011-2
DOI: [10.1016/j.jvlc.2017.03.001](https://doi.org/10.1016/j.jvlc.2017.03.001)
Reference: YJVLC 773



To appear in: *Journal of Visual Languages and Computing*

Received date: 18 September 2015
Revised date: 21 April 2016
Accepted date: 21 March 2017

Please cite this article as: Takayuki Itoh, Ashnil Kumar, Karsten Klein, Jinman Kim, High-Dimensional Data Visualization by Interactive Construction of Low-Dimensional Parallel Coordinate Plots, *Journal of Visual Languages and Computing* (2017), doi: [10.1016/j.jvlc.2017.03.001](https://doi.org/10.1016/j.jvlc.2017.03.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

High-Dimensional Data Visualization by Interactive Construction of Low-Dimensional Parallel Coordinate Plots

Takayuki Itoh^a, Ashnil Kumar^b, Karsten Klein^c, Jinman Kim^b

^a*Ochanomizu University.*

^b*The University of Sydney.*

^c*Monash University.*

Abstract

Parallel coordinate plots (PCPs) are among the most useful techniques for the visualization and exploration of high-dimensional data spaces. They are especially useful for the representation of correlations among the dimensions, which identify relationships and interdependencies between variables. However, within these high-dimensional spaces, PCPs face difficulties in displaying the correlation between combinations of dimensions and generally require additional display space as the number of dimensions increases. In this paper, we present a new technique for high-dimensional data visualization in which a set of low-dimensional PCPs are interactively constructed by sampling user-selected subsets of the high-dimensional data space. In our technique, we first construct a graph visualization of sets of well-correlated dimensions. Users observe this graph and are able to interactively select the dimensions by sampling from its cliques, thereby dynamically specifying the most relevant lower dimensional data to be used for the construction of focused PCPs. Our interactive sampling overcomes the shortcomings of the PCPs by enabling the visualization of the most meaningful dimensions (i.e., the most relevant information) from high-dimensional spaces. We demonstrate the effectiveness of our technique through

Email addresses: itot@is.ocha.ac.jp (Takayuki Itoh), ashnil.kumar@sydney.edu.au (Ashnil Kumar), karsten.klein@monash.edu (Karsten Klein), jinman.kim@sydney.edu.au (Jinman Kim)

Download English Version:

<https://daneshyari.com/en/article/6934643>

Download Persian Version:

<https://daneshyari.com/article/6934643>

[Daneshyari.com](https://daneshyari.com)