

VisServer - A Visual Analytics Framework

Tobias Ruppert*
Fraunhofer IGD

Sebastian Bremm†
TU Darmstadt

Tobias Schreck‡
TU Darmstadt

Joern Kohlhammer§
Fraunhofer IGD

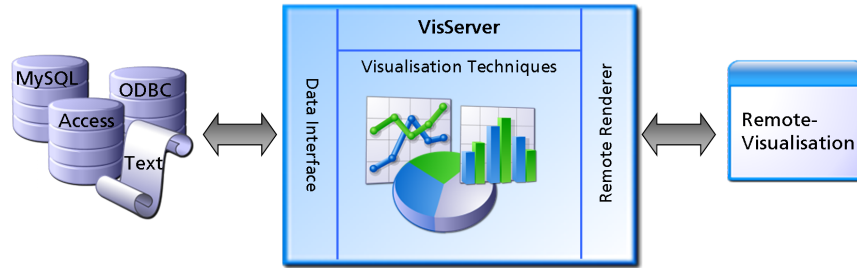


Figure 1: VisServer with the standard data interface (left) and the remote visualization tool (right)

1 Introduction

Many information visualization and visual analytics technologies have to deal with the problem of connecting different heterogeneous data sources to multiple visualization and data mining techniques. An additional challenge is to visualize these techniques on different output devices. Moreover, the visualizations and data mining techniques have to communicate and exchange data during the analysis of the data sets. The first two tasks can be specified as the beginning and the end of Card’s information visualization pipeline [Card et al. 1999]. The third task is denoted in the connections between the different pipeline blocks.

A framework that realizes these three tasks via a standardized data interface and a remote visualization tool will bring a huge benefit for the integrated visual analytics and information visualization techniques. It will enable a quick and robust import of data types coming from different data sources. The data mining and visualization techniques adapted to the data interface can be connected interactively via the framework, which is an important approach for visual analytics. Another benefit is the possibility to use the analytical techniques on different output devices. Such a framework can enable users to access even confidential data without giving away the data itself.

Existing approaches like Manyeyes [Viegas et al. 2007] as a web service enable the user to upload his or her own data set and visualize it with provided visualizations. The visualization framework Snap-together [North and Shneiderman 2000] specializes in connecting different visualizations which enables “brushing and linking”.

In our approach we define a standard data interface in C++ and Java that handles the connection to several data sources. Furthermore, we developed a remote visualization tool that realizes the transmission of the window content via a Flash application.

2 Our approach

Our data interface is constructed similar to a common database interface. It consists of several components that connect the framework to data sources in formats like MySQL, ODBC, Access and CSV. The data is imported via a standardized internal data format. The interface can handle common request components like sort, filter, etc. Instead of importing arrays of strings, it returns data objects that can be handled with standard get- and set-methods. Databases can easily be exported to local files for demo purposes, since there is a flexible common interface to databases and files. Furthermore, the standardized data format enables the fast data exchange between different visualizations. Another advantage is the extensibility of the interface by adding format components to the system.

The remote visualization tool is realized via a program that monitors the applications running on a server system. The window content of the application is grabbed and sent to a client that displays the frames via a Flash application, that can be used on most of the common output devices. The interaction with the application is replicated by the tool and sent back to the server. Through this realization only the content frame, not the confidential data, is transferred to the output devices.

The visualization framework is developed by Fraunhofer IGD and TU Darmstadt to set up an extensible visualization toolbox.

References

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*e-mail: tobias.ruppert@igd.fraunhofer.de

†e-mail: sebastian.bremm@gris.informatik.tu-darmstadt.de

‡e-mail: tobias.schreck@gris.informatik.tu-darmstadt.de

§e-mail: joern.kohlhammer@igd.fraunhofer.de