

Short note: Enhanced visualization for seismic imaging

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ABSTRACT

I have developed a new visualization package for seismic images. SEP's existing visualization toolkit, including Grey, Graph, Wiggle, Contour, and Cube, will be integrated into a novel, unified, open-source tool. Enhanced features include interactive manipulation of graphics, efficient file-access for large data sets, network-streaming for large files, 3D acceleration options, and platform portability.

This new suite of technologies will be capable of tight integration with processing workflows, enabling interactive processing. At the same time, it preserves the best features of our legacy tools, and provides a compatibility layer for seamless integration into existing environments. JTube charges forward with new features, and capitalizes on a quarter-century of technological advances since the last major design of SEP's visualization tools.

INTRODUCTION

Stanford Exploration Project is an academic consortium whose primary purpose is to improve the theory and practice of constructing 3-D and 4-D images of the Earth from seismic echo soundings. In Clapp et al. (2008), a new viewer, *Hypercube*, based on the QT graphics library was introduced. Existing SEP plotting and graphing utilities, while sufficient for basic visualization, have not kept pace with the rapidly changing technological landscape of modern computer hardware, operating systems, and commercial visualization tools.

In response to this issue, I have completely redesigned the existing SEP visualization utilities: Graph, Grey, Wiggle, Contour, Cubeplot, and the Tube utility. The new software is designed to be modular, object-oriented, and extensible. The resulting utility is a tightly-integrated, well-managed, and efficient suite of seismic visualization tools that enable more advanced image creation.

Practical details of the new implementation address common usability issues that have plagued SEPlib users, both within the research group and among our industrial sponsor user-base. Behind the scenes, the code is designed to be object-oriented and easily extended if new plotting features are required. The implementation takes advantage of the Java platform, allowing portable and efficient graphical interfaces.

The new project has tentatively been named JTube, wrapping all visualization utilities into a single front-end interface. Individual plot tools are accessible from the command line or via an interactive interface.

REQUIREMENTS

The JTube software requires a Java 6 virtual machine to run. To build the project, a Java 6 software development kit (SDK) is required, and the Apache Ant build tool is recommended (but not required). The system will compile with any Java 6 SDK, and has been tested with Sun, OpenJDK, and GCJ.

BUILDING AND RUNNING

The command to build the distribution package is `ant dist`. This will compile all source code, package it as an executable archive, and copy the entire output and utility scripts into the distribution output directory.

To run the program, change directory to the distribution directory, or add this directory to the path. The command `JTube` will start the program. A complete list of command-line arguments can be found in the extended documentation. This documentation can be viewed with any text editor or web browser, and will be automatically generated during the build. It can also be manually built using the command `ant doc`.

Future revisions of JTube will be available through SEP or at

<http://www.nimur.com/projects/JTube>.

REFERENCES

Clapp, R. G., D. M. Chen, and S. Luo, 2008, Hypercube viewer: SEP-Report, **134**, 179–192.