

## **JGrass, a multi-platform, multi-session GRASS - the framework and features**

John Preston  
ICENS, University of the West Indies

Andrea Antonello  
Department of Civil and Environmental Engineering / CUDAM, University of Trento

Riccardo Rigon  
*Department of Civil and Environmental Engineering / CUDAM, University of Trento*

### **Abstract**

The Geographic Resource Analysis Support Software (GRASS) is the largest Geographical Information System (GIS) open source software project. From its birth in 1982 at the US. Army Corp of Engineers Laboratories (CERL) in Illinois, it has found its way into many Universities and Research Laboratories. Its wide array of raster, vector, point, image processing, graphics production capabilities, and extensibility through source code availability has kept it alive.

However, one of the main obstacles to its widespread adoption by GIS professionals in production environments is its lack of a modern graphical user interface (GUI) with all the attendant benefits, and major portability issues with the Windows and Macintosh computer systems. To address these issues a development effort has commenced that seeks to move GRASS into the main stream of GIS software used by researchers and professionals across all the major computer operating systems.

JGrass as it is named, combines GRASS and the Java programming paradigm to achieve a portable, modular, and extensible GIS for the 21st century. The goals of the JGRASS project are to improve:

- \* Portability, enabling GRASS to be fully functional on the Windows, Unix/Linux and Mac-OS platforms;
- \* Extensibility, providing a framework for the incorporation of user developed modules and providing specialised functions for visual representations or graphical interaction with the map data;
- \* Standalone/Networked Access, allowing standalone operation interacting with local and networked databases, but also allowing access to group based spatial processing capabilities;
- \* Scripting, providing a java based scripting engine to allow the development of application scripts;
- \* The ease of Use, providing missing features common to state of the art GIS applications, especially in the fields of printing and creation of artworks.

JGrass will have a new graphics system based on OpenGL, offering both 2D and 3D display capabilities, a terrain engine for view-dependent visualization of large surfaces, an interactive legend, and interactive selection of viewing parameters. It is modular in design, providing a base framework and plugin architecture that allows the structured addition of user developed modules. It features an application model where users define mapsets, databases, menus, scripts and other data entities linked to a single theme, which can be accessed concurrently.

An icon controlled printing system allows easy production of hardcopy maps in various formats and for different output devices.

A standardized data access model provides a consistent way for all commands to access data from either GRASS database files or databases via jdbc.

The choice of Java as the operating environment and programming platform will provide an "industrial-strength" runtime environment, and robust development support in terms of syntax and libraries, to help users utilise a broad spectrum of hardware and software open source tools.

JGrass will provide a stable base to carry GRASS users into the future.