FOSS4G 2006 - Free And Open Source Softwa

Contribution ID : 154

New approaches in modelling, analyses and visualisation of volume data with GRASS and VTK

Friday 15 Sep 2006 at 09:00 (00h30')

For many years GRASS supports the creation, modelling and visualisation of volume data. The existing modules for ascii import, map calculation and spline interpolation from 3d vector data made available a rudimentary approach of volume data modelling and analyses. The visualisation of this data was realised by nviz or Vis5D.
Since last year this capability has been widely extended by providing new modules for raster->volume, volume->raster conversion as well as volume cross section and 2d elevation->volume conversion. With the new export modules for volume, raster and vector data into the VTK format, the support of a sophisticated visualisation tool kit for data visualisation and analyses is now available.

In the first part of this presentation the new capabilities of GRASS for creating and modelling volume data will be introduced. This introduction includes a brief discussion about some existing modules like
* r3.mapcalc
* v.surf.vol
* r3.in.ascii
and a detailed discussion about the new modules
* r.to.rast3 (which converts 2D raster map slices to one 3D raster volume map)
* r3.to.rast (which converts 3D raster maps to 2D raster maps)
* r3.cross.rast (which creates cross section 2D raster map from a g3d raster volume map based on a 2D elevation map)
* r.elev.to.rast3 (which creates a 3D volume map based on a 2D elevation and value raster map).
The second part will show how to export, visualise and analyse the volume data with the Visual-Tool-Kit VTK. The meaning of ?VTK? will be explain as well as why it was chosen to visualise and analyse the GRASS volume data.
The GRASS module r3.out.vtk for volume data export will be introduced as well as r.out.vtk and v.out.vtk for raster and vector export. The visualisation and analyses capabilities of VTK will be presented with Paraview (based on VTK).

Paraview provides a wide range of functionalities to process the imported volume data
like cut and cross-section filter, threshold filter, vector visualisation,
iso-surface creation and so on. Therefore it will be briefly explain how to handle
the imported GRASS data with Paraview.

Primary authors : Mr. GEBBERT, Sören (Technical University Berlin)

Co-authors :

Presenter : Mr. GEBBERT, Sören (Technical University Berlin)

Session classification : Session 12 : GRASS

Track classification : --not yet classified--

Type : Conference