GRASS GIS: A General-purpose Geospatial Research Tool

AGU 2018 Fall Meeting

NS52A: A Tour of Open-Source Software Packages for the Geosciences II

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**Includes over 10 other members of the core team and numerous other contributors

NC STATE UNIVERSITY mundialis

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GRASS GIS

- all in one
  - hydrology modeling, image segmentation, point clustering, …
- driven by needs of users
  - Community-driven project direct access to development process
- from small laptops to supercomputers
  - Raspberry Pi, Windows, Mac, GNU/Linux, FreeBSD, IBM AIX
- learn now, use forever
  - over 35 years of development and interface refinement

latest release 7.4.3 (Nov 26, 2018)

Novel methods are included

- r.sim.water (Mitas and Mitasova, 1998) overland flow simulation
- Least cost flow r.watershed from ’89

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Innovations are preserved

- r.sim.water (Mitas and Mitasova, 1998) overland flow simulation
- Least cost flow r.watershed from ’89

latest release 7.4.3 (Nov 26, 2018)

Code is further developed

- v.outlier module serves as a base for v.lidar.mcc implementing Multiscale Curvature Classification.
- v.surf.rst for spatial interpolation developed in '90s; improved several times and parallelized for version 7.4.

latest release 7.4.3 (Nov 26, 2018)

Tools used by other scientists

- v.outlier module serves as a base for v.lidar.mcc implementing Multiscale Curvature Classification.
- v.surf.rst for spatial interpolation developed in '90s; improved several times and parallelized for version 7.4.

latest release 7.4.3 (Nov 26, 2018)

Published algorithms are implemented

- v.outlier module serves as a base for v.lidar.mcc implementing Multiscale Curvature Classification.
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Publishing code

- Ask for access to GRASS GIS Addons at
  `grass.osgeo.org/development/code-submission`
- Example GRASS GIS module
  `gitlab.com/vpetras/r.example.plus`

Get GRASS GIS at
`grass.osgeo.org`

GRASS user mailing list
`lists.osgeo.org/listinfo/grass-user`

Source files for poster and slides available at
`trac.osgeo.org/grass/browser/grass-promo`

Providing algorithms to the community

- new landform recognition approach – geomorphons
- by Jasiewicz and Stepinski from

  AMU, Poland and University of Cincinnati, USA
- not just a paper Geomorphology, 2013
- not just a code

  at some webpage
- *r.geomorphon*

  module in GRASS GIS addons repository

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  - Raspberry Pi, Windows, Mac, GNU/Linux, FreeBSD, IBM AIX
- learn now, use forever
  - over 30 years of development and interface refinement
- used by
  - US Oak Ridge National Laboratory, Edmund Mach Foundation, JRC, …

latest release 7.0.4

GUI

Python and command line interfaces

Command Line:

```
r.in.lidar input=points.las \
           output=elevation -e
```

Python:

```
from grass.script import run_command
run_command('r.in.lidar',
            input="points.las",
            output="elevation",
            flags='e')
```

Graphical Modeler

Using other open source projects

r.in.kinect

- scans using Kinect
- OpenKinect libfreenect2
- Point Cloud Library (PCL)
- GRASS GIS libraries

used in Tangible Landscape

Acknowledgements

Software

The GRASS GIS Development Team, contributors, users, ...

Datasets

Nantahala NF, NC: Forest Leaf Structure, Terrain and Hydrophysiology. Obtained from OpenTopography.
`http://dx.doi.org/10.5069/G9HT2M76`

Presentation software

Slides were created in LaTeX using the BEAMER *class*.