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IMPLEMENTATION OF MULTICRITERIA MODULES IN A GEOGRAPHIC INFORMATION SYSTEM

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ABSTRACT

This paper presents the implementation of multi-criteria modules in an open source GIS system. Features, possible use and output of the following implemented modules are presented:

r.mcda.electre, implementing the ELECTRE multicriteria algorithm;

r.mcda.fuzzy, implementing the FUZZY multicriteria algorithm proposed by Yager;

r.mcda.regime, implementing the REGIME multicriteria algorithm;

r.mcda.roughset, implementing Dominance based Rough Set Approach (Greco, S., Matarazzo, B., Slowinski, R., 2001).

A fifth module, r.roughset., is based on the implementation of the classical rough set theory (Pawlak, 1982), used for classification, not for ranking or ordering.

To implement the algorithms GRASS 6.3 has been used, adding a specific module written in C language. In addition, the new module has been included in the GRASS toolbox, in QGIS 0.10.

The MCDA suite is available in the GRASS addons repository (<http://trac.osgeo.org/grass/browser/grass-addons/raster/mcda>) with GNU GPL license. All modules are actively being tested using several case studies.

We present the application of the r.mcda.roughset module to a case study on land use.