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New insights into high resolution DEM structural analysis with Coltop3D software

R. Metzger, M. Jaboyedoff, and T. Oppikofer

Earth Science and Environment Faculty, University of Lausanne, Switzerland, Institute of Geomatics and Risk Analysis, Lausanne, Switzerland (richard.metzger@unil.ch)

Modern measurement devices such a terrestrial laser scanning (TLS) systems allow for collecting tremendous amount of (x,y,z) points (up to 20 millions) within a few minutes. However, data analysis still may be impaired because of software limitations, which are usually not designed to handle such huge data sets. To overcome this shortcoming, a software – Coltop3D – was written from scratch. Coltop3D aims at providing the geosciences community a powerful tool to visually handle seamlessly large point clouds and large regular grids DEM, at allowing for straightforward visual analysis of the data with different colour scheme, and at providing specific geologist and/or geoscientist treatment methods such as structural analysis.
The main features of Coltop3D are as follow:

1) Ability to handle huge data sets (up to 150 millions points);
2) Coloring the surface with a color scheme linking computer graphics HSV wheel and Schmidt-Lambert stereonet projection;
3) Ability to select a subset of a point cloud with complex geometric shapes;
4) Ability to select a subset of a point cloud with dip and dip direction values;
5) Creating density stereonets with selected subset;
6) Easily import from or export point cloud data to third party software.

Besides the technical and basic capabilities of Coltop3D, specific case studies such as structural analysis and rock fall analysis will be presented.