

*\* The author(s) of each abstract is/are solely responsible for the content.*

## ABSTRACTS

### *LOD2 Building Generation – Experiences and Comparisons*

**Iuliana Maria Pârvu**(Romania), **Fabio Remondino** (Italy)

Keywords: LOD2, VOLTA, Point Cloud, Segmentation, DTM, DSM, RANSCA, Region Growing

#### Abstract

The VOLTA project (<http://volta.fbk.eu>) is a RISE Marie-Curie action designed to realize Research & Innovation (R&I) among intersectoral partners to exchange knowledge, methods and workflows in the geospatial field. To accomplish its objectives, the main R&I activities of VOLTA are divided in four interlinked Work Packages with two transversal ones responsible for knowledge transfer & training as well as dissemination of the project results. The research activities and knowledge transfer are performed with a series of secondments between partners. The consortium is composed of 13 partners from academic & research institutions, industrial partners and national mapping agencies. The Romanian National Center of Cartography is part of this research project and in this article the achievements of the secondment at Bruno Kessler Foundation (FBK) in Trento (Italy) are given.

The main goal of the exchange was to generate LOD2 building models in an automated manner from photogrammetric point clouds and without any ancillary data. The dataset belongs to the ISPRS benchmark on oblique imagery (Dortmund City, Nex et al., 2015). A typical way to obtain LOD2 buildings models is to segment the available point cloud, to identify the roof areas, define planar surfaces and then generate the 3D geometries. The point cloud segmentation was performed using a FBK tool for the region growing algorithm based on the PCL libraries. The goal is to get each building in separate cluster and to decrease the number of eliminated points. The tool splits the point cloud in as many point clouds as the number of clusters. Then, using RANSAC method implemented in Mapple, planar surfaces are fitted to generate a 3D building model for each building separately (Nan and Wonka, 2017).

To benchmark existing commercial solutions for the realization of LOD2 building models, we tested Building Reconstruction (Virtual City System, 2018). This program generates LOD2 models starting from building footprints, DTM and DSM. The ground information taken from the DTM is used to determine the ground level of the buildings. The DSM is used to determine the building height and extract primitives for the roof areas. The process ensures that the roofs do not exceed the footprint of buildings and thus provides compliance with the 2D map. If the input data are accurate and respect all conditions set up by the software, the result will be accurate as well.

The presented work examined a research and a commercial-based approach to reconstruct LOD2 building models from point clouds. The full paper will report all technical details of the work with insight analyses and comparisons.