

3D point cloud classification for mapping purposes

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Target audience: Staff of national mapping agencies, researchers, academic people, students, private companies

Preconditions: Familiarity with 3D point clouds and semantic concepts

Course objectives: the course will present the latest developments and solutions for aerial point cloud classification, with particular emphasis on mapping needs, activities and purposes. Various methods will be presented and evaluated, from Random Forest to neural networks, with theoretical and practical lectures.

Topics tackled: pattern recognition, point cloud generation, feature extraction, machine/deep learning

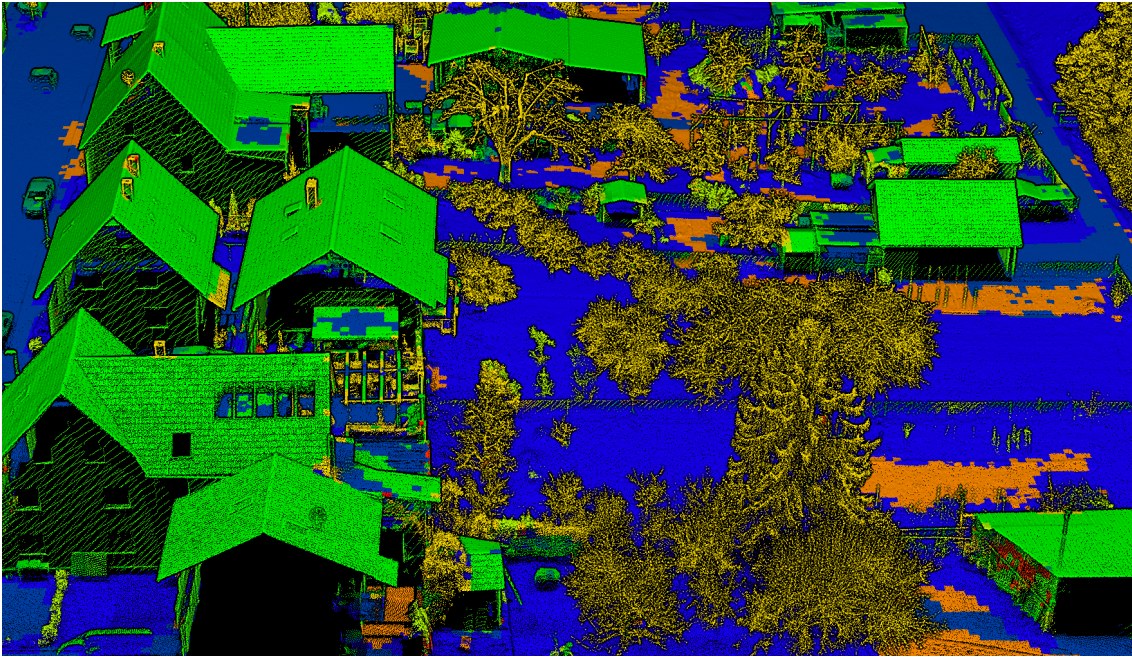


Module 1: Recap on pattern recognition and Deep Learning

The first module will focus on standard approaches for 2D image classification, which will be extended to 2.5D processing, i.e. a nDSM layer. These approaches are the basis for the successive extension to 3D.

Module 2: Point cloud generation and feature extraction

The aim of the module is twofold: (i) to review sensors and methods for the generation of dense point clouds (i.e. LiDAR and Multi-View Stereo – MVS) and (ii) to investigate feature extraction solutions to perform 3D classifications.



Module 3: 3D classification with Machine/Deep learning

The last module will present state-of-the-art methods to semantically enrich airborne point clouds, from Random Forest to neural networks. Theoretical aspects will be coupled to exercises to evaluate the performances of the different methods.

