

Automatic extraction of buildings and impervious areas from very high resolution data in suburban area of Prague

Abstract

Nowdays, when the very high resolution satellite imagery and airborne laser scanning data have become more accessible, the possibility of their use for different types of applications increased also. With a rapid development of urban hinterlands the demand to monitor these areas increases also with the goal to avoid uncoordinated construction. This work therefore focuses on an object oriented based classification in order to design its own methodological approach for the extraction of buildings and impervious areas in selected areas of commercial suburbanization in the Prague hinterland. The aim is among others to find the classification rules for distinguishing different types of roofs and impervious areas depending on the material, shape characteristic etc. The literature overview summarizes methods of buildings and impervious areas classification and extraction using very high resolution optical data and elevation data.

Very high resolution QuickBird imagery and airborne laser scanning LIDAR elevation data and object oriented classification methods were used for and analysis of selected commercial suburbanization model areas in Prague hinterland. The proposed methodology uses elevation information from nDSM layer (normalized digital surface model) and also set of proposed classification rules for the extraction of various types of roofs and other impervious areas. Software eCognition 8.0 was used for the classification. Results of the classification were exported to a shp. format and classification accuracy was evaluated comparing the classification output with reference vector layers, which were an output of manual vectorisation of the same image data.

The accuracy of results is satisfying. The proposed approach with using elevation data is suitable for monitoring commercial suburbanization and impervious areas. The technique can be used to update the information about area and for monitoring of suburbanization development.

Keywords: OBIA, nDSM, QuickBird, building and impervious surfaces, commercial suburbanization, eCognition