

Object-Oriented Classification

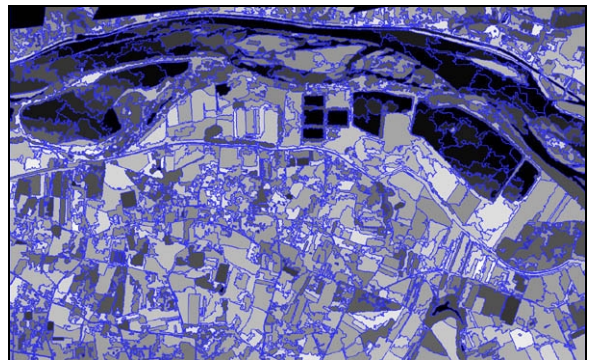
The use of object information such as intensity is an area of increasing interest to our clients. Object information allows for more sophisticated data segmentation and improves the automated classification of the elevation data. Until recently, the automated classification of Lidar data has focused on the spatial relationships between ground and non-ground points, with a relatively high potential for misclassification leading to a significant amount of manual editing. However, the latest generations of Lidar instruments routinely supply the user with an additional observable: the intensity of the reflected signal.

The intensity measurement is related to the IR reflective properties of the surface as well as the geometry of the measurement itself. While absolute reflectivity can be extremely difficult to calculate, relative intensity can be used to perform a further thematic interpretation of the mapped terrain. At TerraImaging we have developed software tools to classify the intensity data using object-oriented methods, image segmentation, supervised classification techniques and knowledge-based hierarchical classification.

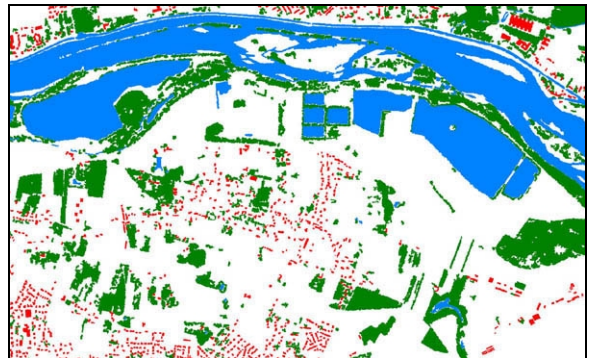
The classification procedure starts with an image segmentation based on the single intensity band. After segmentation a supervised classification is performed, using samples for the different classes (roads, vegetation, houses, and fields). Using a nearest neighbour classifier the defined set of classes can be separated automatically. Although the intensity data set is just a monochromatic image, an unambiguous classification result can generally be achieved quite quickly, resulting in improved processing efficiency, especially on large projects where manual editing tends to seriously reduce productivity, and a more sophisticated end product. Our project experience to date has shown that object-oriented approaches can result in powerful solutions for the interpretation of high resolution elevation and intensity data.



France, River Loire: intensity data is the basis for classification



The image is segmented into spectrally homogenous objects



Classification result (water, vegetation and buildings)

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