Bright Perspectives of Mapping from Above

Recent technological developments have made aerial surveying more exciting than ever. For imagery, ground resolutions of 2cm can now be reached, whereas for Lidar, pulse frequencies of 4GHz and point clouds of 30-40 points/m^2 are no longer unusual. Simultaneous acquisition of imagery and Lidar is becoming increasingly popular.

To optimize the production chain and improve the workflow, many survey companies are looking to artificial intelligence (AI) and deep learning (DL) as the holy grail. Given the impressive amount of training data available, the continuously better performing CPUs and GPUs and the many hours of research invested in this subject, there is no doubt that AI and DL will play a bigger role in our industry in the near future. For example, the automatic extraction of trees remains a challenge many would like to tackle, and Eurosense is obtaining good results in that regard. However, AI is not magic, so it would be wise to exercise a certain level of caution in its application.

The combination of recent technological developments and workflow improvements has led to better, faster and more accurate 3D models, pushing the limits towards (textured) LOD 3.3 and making an array of applications accessible to more customers every day. Such applications of 3D city models in GIS environments include automatic approval of building permits and complex analysis such as green-roof potential, water storage capacity and air pollution simulations. In these challenging times due to COVID-19, we are all encouraged to work from home and substantially limit the number of site visits. With a precise and recent 3D model, we can visualize and analyze a virtual clone of the reality, dubbed a 'digital twin', from behind our desks instead.

To build the ultimate 3D model, aerial 3D models (based on Lidar and imagery captured from the sky) could be completed with thermography and in situ data. The main challenges encountered in this regard are the different workflows and accuracies to deal with, and the automatic vectorization of Lidar point clouds. A right balance between XYZ accuracy, and time as well as cost, will have to be found.

Recently our industry has witnessed an improvement in the 'look and feel' of 3D models. An aesthetically attractive, interactive and immersive model reaches a wider public as it increases engagement, improves understanding and optimizes the experience. Rich 3D models lead to strong visual communication, superior insights and better decisions.

Sharing the 3D model with a broad audience is also an important part of a successful 3D model. Esri software offers an integrated platform for 3D visualization and analysis, and also makes the link with building information modelling (BIM) and indoor mapping. To add an extra dimension, Internet of Things (IoT) sensors can easily be integrated in the 3D model and dashboards to provide real-time information.

In conclusion, Eurosense sees a bright future for 'mapping from above', especially with regards to 3D products and applications. Demand is continuously increasing for better 3D products, and technological evolutions make a larger offering available at a more attractive price. These are exciting times indeed for our sector, and… the sky is the limit!

3D model realized by Eurosense, with integrated new construction and thermography data.