



MIDAS, Pictometry or BlomOblique, is used for capturing cities and other large areas.

MONOPLOTTING

Unlike nadir images, oblique airborne images depict scenes similar to the way humans look at objects from ground view, and therefore they are often used for reconnaissance, taxation, registration and inspection. Tools are available to visualise the images such as Pictometry Esri interface or the Slagboom en Peeters GIS viewer. These tools are not meant for measuring. Measuring can be done by monoplottting, a technique for collecting 3D coordinates from a single (oblique) image combined with a digital terrain model (DTM) of sufficient quality of the same scene. Oblique images also enable easy measurement of the height of buildings and other objects (Figure 3). The image coordinates of the top and base point are measured through heads-up digitisation, from which dr can be computed. The ray through the base point and the projection centre (O) intersects with a DTM, thus giving the planar object space coordinates of the base point. Assuming that the building is vertical, the top point will have the same planar coordinates as the base point which allows to compute the height difference (dh) from dr . Such measurements can be conducted with the Pictometry Electronic Field Study



▲ Figure 4, Dense matching result (PMVS2: patch-based multi-view stereo software) and meshing (Meshlab, Poission reconstruction).

◀ Figure 3, Principle of monoplottting.

(EFS) system and BLOMDesktop software.

3D CITY MODELLING

Oblique aerial views of urban areas significantly ease the creation of 3D city models. As with mobile mapping systems, street views of buildings can be acquired although the ground sample distance (GSD) is usually much smaller. A distinct advantage of airborne images is that they provide views of the rear sides of buildings and roofs. Services enabling highly automatic creation of 3D city models from oblique views are BlomUrbex 3D and Slagboom en Peeters 3D. Eagleview, a subsidiary of Pictometry, creates detailed CAD drawings from buildings (roof and wall report) for easy estimation of material needs for roof maintenance,

for instance. Visualisation and other applications may suffice using closed surface reconstruction alone. Since 2010, dense image matching has entered photogrammetric production workflows aiming at one height value for each and every image pixel. Meshing of the point clouds enables the creation of a closed surface description, followed by texturing. Figure 4 shows a meshed point cloud. In addition to semi-global matching (SGM) and patch-based multi-view stereo software (PMVS), both established techniques published in some open source projects, commercial software such as EADS Street Factory is available.

CONCLUDING REMARKS

Automation is expected to increase within scene interpretation and 3D city modelling in the future. ◀

FURTHER READING

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