

A new benchmark dataset for multi-platform very high resolution photogrammetry

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Airborne high resolution oblique imagery systems and RPAS/UAVs are very promising technologies that will keep on influencing the development of geomatics in the future years closing the gap between terrestrial and classical aerial acquisitions. These two platforms are also a promising solution for National Mapping and Cartographic Agencies (NMCA) as they allow to derive complementary and sometimes better mapping information. Although the interest for the registration and integration of aerial and terrestrial data is constantly increasing, only few works have been truly performed on this topic. Several investigations still need to be undertaken concerning algorithms ability for automatic co-registration, accurate point cloud generation and feature extraction from multi-platform image data. One of the biggest obstacles is the non-availability of reliable and free datasets to test and compare new algorithms and procedures. In particular, a complete benchmark on oblique, UAV and terrestrial images together has never been realized before.

For these reasons, this scientific initiative will use the grant provided by ISPRS mainly to collect and share state-of-the-art multi-sensor data over an urban area, specifically: oblique airborne images, UAV-based images and terrestrial images of some selected buildings. In addition, reference points and Terrestrial Laser Scanning (TLS) data will be acquired to enable a thorough evaluation of image orientation and calibration methods, as well as of dense image matching results. Interested researchers will be encouraged to use the image data (from one platform, or a merge) to participate in the orientation benchmark through submitting 3D coordinates of independent check points distributed all over the area. Results from image dense matching will be evaluated using cross-sections, best fitting and high-resolution TLS point clouds. Although the benchmark will focus on the mentioned tasks, other research, e.g. on radiometric properties or semantic scene analysis using those images can be accommodated. Through the provision of this dataset to the photogrammetric, computer vision and adjacent communities, we expect that the value of those state-of-the-art platform's data can be evaluated more objectively. Last not least, the visibility of ISPRS across domains will be promoted and its connection with other societies (e.g. EuroSDR) and communities will be strengthened.