

Unlocking the Potential of UAS for Surveying and Mapping

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ABSTRACT

An Unmanned Aerial System (UAS) is a cutting-edge tool for surveying and mapping to supplement and extend conventional surveying technology in a number of ways. The UAS aerial photogrammetric survey capability has numerous applications, such as land surveying, mining surveying, construction monitoring, volume estimation and agriculture. Automatic and robust UAS photogrammetric image processing software packages require little professional surveying knowledge or expertise to produce impressive geospatial products, such as textured 3D point clouds, digital surface models and ortho-mosaic image maps. This implies that everyone can now execute a photogrammetric project. However, can they state the true accuracy of their UAS survey in the same manner that surveyors do? UAS surveying is a specialised engineering task, which requires surveying and geospatial professional expertise to plan the image collection task, efficiently conduct the aerial survey and evaluate the products' precision or accuracy. With this in mind, the School of Civil & Environmental Engineering at the University of New South Wales (UNSW) has acquired several survey-grade, fixed-wing and multi-rotary Unmanned Aerial Vehicles (UAVs) with cameras, obtained the RPA Operator's Certificate from CASA, and has been teaching UAS photogrammetric mapping in surveying and geospatial engineering subjects since 2014. This presentation will discuss UAS surveying project planning, UAS operations in Australian airspace, ground control point surveys, aerial image acquisition and processing, product accuracy evaluation, and introduce some UAS photogrammetry applications. In addition, it will be discussed how UAS technology is supporting teaching and research at UNSW.

KEYWORDS: UAS, UAV, surveying, mapping, photogrammetry, geospatial.