

## Methodology and Credibility of Unmanned Aerial Vehicle-Based Cadastral Mapping

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**Abstract :** The cadastral map is the rationale behind city management planning and development. For years, cadastral maps have been produced by ground and photogrammetry platforms. Recent evolution in photogrammetry and remote sensing sensors ignites the use of Unmanned Aerial Vehicle systems (UAVs) for cadastral mapping. Despite the time-saving and multi-dimensional cost-effectiveness of the UAV platform, issues related to cadastral map accuracy are a hindrance to the wide applicability of UAVs' cadastral mapping. This study aims to present an approach leading to the generation and assessing the credibility of UAV cadastral mapping. Different sets of Red, Green, and Blue (RGB) photos were obtained from the Tarot 680-hexacopter UAV platform flown over the Universiti Putra Malaysia campus sports complex at an altitude range of 70 m, 100 m, and 250. Before flying the UAV, twenty-eight ground control points were evenly established in the study area with a real-time kinematic differential global positioning system. The second phase of the study utilizes an image-matching algorithm for photos alignment wherein camera calibration parameters and ten of the established ground control points were used for estimating the inner, relative, and absolute orientations of the photos. The resulting orthoimages are exported to ArcGIS software for digitization. Visual, tabular, and graphical assessments of the resulting cadastral maps showed a different level of accuracy. The results of the study show a gradual approach for generating UAV cadastral mapping and that the cadastral map acquired at 70 m altitude produced better results.

**Keywords :** aerial mapping, orthomosaic, cadastral map, flying altitude, image processing

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