

無人飛行載具掛載消費型攝影機應用於防災可行性研究

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摘 要 無人飛行載具 UAV(Unmanned Aerial Vehicle)發展技術日漸成熟，然透過 UAV 高空攝影技術可安全的、快速地蒐集地面景物資料，過去 UAV 系統多搭載具有高解像力之單眼相機進行拍攝，獲取高精度地面資料，本研究採用低單價消費型攝影機(GOPRO HERO3)進行高空 4K 動態攝影，其動態影像可快速且不間斷存取地面景物資料，錄影資料可連續拼接大圖、製作空中動(靜)720 度環景影像、正射影像、建構立體視圖及地形 DSM 等資料，搭配 Pix4Dmapper 影像處理軟體，獲取地面高程(DSM)資料，與同時期地面斷面測量資料相較誤差，平面精度 X 平均誤差 0.06 公尺，Y 平均誤差 0.03 公尺，Z 平均誤差 0.13 公尺，於一千分之一製圖標準，平面絕對精度須小於 25 公分之規定，高程精度須小於 30 公分之規定，應用於防救災需快速取得地面資料相對可行。

關鍵詞：無人飛行載具、消費型攝影機、Pix4Dmapper 影像處理軟體。

UAV Mount Consumer Camera Feasibility Study Applied to Disaster Prevention

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ABSTRACT UAV (Unmanned Aerial Vehicle) development technology matures, through UAV aerial photography can be safely and quickly gather information on the ground scenery, over the past UAV system is equipped with a high resolution of monocular camera to shoot, access high-precision surface data in this study use low-priced consumer camera (GOPRO HERO3) aerial 4K video, which the film can be fast and uninterrupted data access ground scenery, video data can be continuously mosaic big picture, making 720-degree panoramic videos and images, orthophotos, construct three-dimensional view and terrain information such as DSM, with PIX4Dmapper image processing software, get ground elevation (DSM) data, compared with the ground cross-section measurement data, X average error is -0.06 meters plane accuracy, the average error of Y is 0.03 meters Z average error was 0.13 meters in 1/1000 mapping standards, the absolute accuracy of the plane must be less than 25 cm of the provisions, required less than the specified height accuracy of 30 cm, can be applied to disaster prevention must to quickly get information from the ground.

Key Words : UAV, Consumer digital cameras, Pix4Dmapper.

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