

應用 UAV 載具於東眼山坡面崩塌調查

林宥伯^{[1][2]} 林駿恩^{[1][2]} 陳振宇^[2] 黃德秀^[1]

摘要 UAV 搭配現地控制點進行災後調查，並產製正射影像、數值地表模型等方式，已普遍用於輔助災害調查、紀錄地形特徵、製作數值模擬所需基礎圖資等參考。而在安全考量、現場作業時間、山區數位訊號遮蔽等影響下，可能無法進行現場控制點的布設與測量。缺乏高程控制點與距離誤差累加影響下，數值地表模型基準面有可能產生嚴重偏移。本研究以南投縣仁愛鄉東眼山崩落地調查為例，結合 UAV 正射影像特徵點、內政部 1m 數值地表模型高程、多期衛星影像判釋等輔助，運用 SfM 技術分別對水平與垂直坐標進行擬合校正。成果顯示可降低基準面傾斜誤差，並可應用在人員難以抵達，但現地具備一定地表特徵之數值地表模型校正應用。

關鍵詞：數值地表模型、UAV、SfM。

Apply the UAV to investigate the landslide event in MT. Dongyan

Yu-Po Lin^{[1][2]*} Chu-En Lin^{[1][2]} Chen-Yu Chen^[2] Te-Hsiu Huang^[1]

Abstract UAV are used with on-site control points to conduct post-disaster surveys and produce orthophotos, digital surface models, etc., which have been widely used to assist disaster surveys, record terrain features, and produce basic maps required for numerical simulations. However, due to safety considerations, on-site operation time, and digital signal shielding in mountainous areas, it may be impossible to lay out and measure on-site control points. Under the influence of the lack of elevation control points and the accumulation of distance errors, the base level of the digital surface model may be seriously offset. This study takes the investigation of the landslide event in MT. Dongyan in Ren'ai Township, Nantou County as an example, and uses SfM technology to analyze the horizontal and vertical coordinates respectively with the aid of UAV orthophoto feature points, the Ministry of Interior's 1m digital surface model elevation, and multi-phase satellite image interpretation. The results show that the datum tilt error can be reduced and can be applied to digital surface model correction applications that are difficult to reach but have certain surface characteristics.

Keyword: Digital Surface Model, UAV, SfM.

^[1]財團法人農業科技研究院，*通訊作者 E-mail: unknow@mail.ardswc.gov.tw

Agricultural Technology Research Institute

^[2]農業部農村發展及水土保持署

Agency of Rural Development and Soil and Water Conservation, MOA