

Determination of Accurate Camera Tilt and Altitude of “DJI Mavic 2 Enterprise Dual” Unmanned Aerial Vehicle for surveying Horizontal and Vertical Surfaces

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At present, total stations and level instruments are used for collecting data more accurately. And those instruments can be used for different surfaces accurately. Surveyors also use modern technologies like Unmanned Aerial Vehicle (UAV) surveying to collect data. When conducting UAV surveys in areas with considerable terrain variations, it is important to consider the tilt angle of the camera and the altitude of the UAV to get the highest accuracy possible when considering the data set. Before the UAV is flown, Ground Control Points and checkpoints will be established accurately. The UAV will be flown at different camera tilt angles and altitudes on Horizontal and Vertical surfaces. Observed images will be processed by using Pix4Dmapper software. After data collection, images will be adjusted by using Ground Control Points and check the accuracy of images by using Control Points. In this research expected outcome was selecting the suitable camera tilt angle and altitude of the UAV for collecting data accurately on various surfaces. When determining the camera tilt angle and the altitude the required number of Ground Control Points for surveying various terrain surfaces should be determined as well. In this study was found that five Ground Control Points were enough for a 2500m² area. Also, the most suitable tilt angle and altitude for UAV surveying is 60° tilt angle with 40m altitude respectively for surveying a horizontal surface. Likewise, the most suitable tilt angles and altitudes for UAV surveying are 3m distance from the wall with a 10° tilt angle and 6m distance from the wall with a 10° tilt angle respectively for surveying a vertical surface.

Keywords: UAV, Tilt angle, Altitude, Ground control points

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