Abstract

This study detailed the data collection, processing, and source comparison of DJI Unmanned Aerial System (UAS) drone data from different examples of topographical datasets for accuracy testing. Three datasets were chosen as they were characteristically different, these terrains were those typically encountered while surveying in the energy industry and are representative of terrain types encountered in the south Ohio area. More broadly they are comparable with other terrain systems.

The system used to collect the UAS data consisted of a DJI Phantom 4 unmanned aerial vehicle controlled by DJI Ground Station Pro on an iPad Pro that input and monitored flight parameters. The processing used various software applications. These included Pix4D, which was the photogrammetry software used to convert the data into georeferenced mosaics, models, and point clouds. Additionally, Esri's ArcGIS and Idrisi Terrset were also used in performing analysis.

The data was then analyzed to find correlation to LiDAR and ground control to compare elevation similarities. For the purpose of this study ground control points and LiDAR are considered the trusted source of reference accuracy and precision. Accuracy was assessed against the control material by inversion methods, geometry, and visual assessments. The testing concluded cohesive data precision, accuracy, and detailed the process of creating remotely-sensed materials and their conversion to geometrically accurate data.