

Geo-referencing the satellite image from Google Earth by relative and absolute positioning

ABSTRACT

Introduction of geo-visualisation tools over the internet such as Google Earth (GE) has cut down the cost of data acquisition. This study is undertaken to validate the geo-information provided by GE that could be used for geospatial work. Satellite images and latitude-longitude coordinates (X-Y) for the campus of the University of Malaya has been downloaded from the internet. Geo-referencing of the satellite image was carried out using the relative positioning (RP) and absolute positioning (AP) within the geographic information system environment. Sources of X-Y for AP were obtained from GE and a topography map provided by the Malaysian Survey and Mapping Department. For absolute positioning, the data was obtained using GPS equipment. Comparison of these sources was undertaken with the total residual mean square error (RMSE) of X-Y in the map and at the source. All sources of X-Y had produced the total RMSE within 0.00014 degree. Considering the total RMSE as standard deviation (SD), the resulting range of error for geo-referencing of the satellite image was within 15 m. Thus, it can be concluded that geo-information from GE can be used as the source of base map.

Keyword: Absolute, Georeferencing, Google Earth, Relative positioning, Universiti Malaya, Validation