

Handheld GPS Errors Measurement Based on Reference Map Under Various Landscape Conditions

Summary by Ko Ko Lwin (Division of Spatial Information Science)

1. OBJECTIVE

To measure handheld GPS errors based on reference map under various landscape conditions. The purpose of this measurement is error adjustment for handheld GPS based GCPs (Ground Control Point) collection where base maps are not available and further development of UM_FieldGIS program (GPS integration)

2. INSTRUMENTS

Garmin handheld GPS, Personal computer installed with UM_FieldGIS program



3. TEST DATA & SITE

1. QuickBird Satellite Image (GeoTIFF format, 0.67m X 0.67m spatial resolution)
2. Road network (ESRI Shape file) from GSI
3. Building Footprint (ESRI Shape file) from GSI
4. Test Site: Tsukuba Center Area

4. ERROR MEASUREMENT



Closed space measurement



Semi open space measurement



Open space measurement

5. RESULT

Total measurement points are 11 and following table shows the mean error in each landscape type.

Landscape Types	Mean distance error (m)
Open space mean error	6.45
Semi open space error	11.95
Closed space mean error	13.41

Table 2. Mean distance errors in various landscape conditions

Total errors are between 6 m to 14m. This error is only apply for Garmin handheld eTrex GPS.

GCP collection by GPS is still require for georeferencing for raw image where base map are not available or not reliable.