The Smart Phone as a Survey Tool

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Changing Technology Landscape

Open Source Software

Ubiquitous Mobile Platforms

Web 2.0

Crowd sourcing

Fast Multi-Core Processor

Bluetooth

Accelerometer

Gyroscope

Camera

Wi-Fi

GPS
Smart Phone Application

• Android application written to enable the smart phone to be used as a data collection tool.

DATA FILTERING

Some means of quality control is required to remove outliers from the data.

The data filtering techniques used are:

✓ Using the data quality indicator provided by the Android API from the GPS engine to set a threshold for identifying outliers.

✓ Averaging of data on static points.

✓ Using comparison with accelerometer data to identify and remove gross errors.

Data Correction

• The GPS data collected on the smart phone will contain errors from different sources including orbital, atmospheric and multipath errors.

• There is no access to the raw GPS pseudo-range or carrier phase observables. Therefore differential techniques cannot be performed.

• In seeking to use the smart phone as a surveying tool the data quality and reliability is of importance. Therefore a simple correction methodology was tested.

### Static test on NGB11:

<table>
<thead>
<tr>
<th></th>
<th>Easting</th>
<th>Northing</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart phone Average</td>
<td>454876.698</td>
<td>339692.636</td>
<td>61.452</td>
</tr>
<tr>
<td>Total NGB11</td>
<td>454893.289</td>
<td>339700.255</td>
<td>30.796</td>
</tr>
<tr>
<td>Error</td>
<td>-16.591</td>
<td>-7.619</td>
<td>29.631</td>
</tr>
<tr>
<td>RMS Error</td>
<td>20.094</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corr from NGB12</td>
<td>454878.978</td>
<td>339692.225</td>
<td>50.643</td>
</tr>
<tr>
<td>New error</td>
<td>-14.311</td>
<td>-8.030</td>
<td>19.847</td>
</tr>
<tr>
<td>New RMS Error</td>
<td>14.868</td>
<td></td>
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