iPhone GPS reliability in general aviation - 2010

The reliability of the iPhone's GPS tracking feature was assessed empirically by Perezgonzalez in 2010\(^1\). The research used an iPhone and a specialized tracking device (Spidertracks) on the same training flight. At the end of the flight, the data collected by both technologies were compared. More specifically, data regarding four flight parameters were correlated to assess the tracking variability of the two technologies. The results obtained are shown in the table below for each of the four flight parameters of interest.

### Table 1. Variability assessment

<table>
<thead>
<tr>
<th>flight parameter</th>
<th>Pearson coefficient</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latitude</td>
<td>0.991</td>
<td>p &lt; 0.000</td>
</tr>
<tr>
<td>Longitude</td>
<td>0.997</td>
<td>p &lt; 0.000</td>
</tr>
<tr>
<td>Altitude</td>
<td>0.990</td>
<td>p &lt; 0.000</td>
</tr>
<tr>
<td>Speed</td>
<td>0.927</td>
<td>p &lt; 0.000</td>
</tr>
</tbody>
</table>

### Methods

#### Sample and procedure

- 76 data points (time intervals) comprising data for two paired subsamples: data for Spidertracks, and data for iPhone (four variables each).
- Data points were collected from a single, one hour and seventeen minutes long flight. Both technologies were onboard a Piper PA-28-161 Warrior during a typical training session. No malfunctioning or other problems were found with the technologies, and non-technological variability did not affect the reliability of technology, either. Therefore, further measurements (in time or space) were deemed not necessary.
- The sample size was limited by the maximum number of data points recorded by Spidertracks (which tracked flight performance less frequently, or once per minute). The iPhone, instead, tracked flight performance per second. Thus, the corresponding 76 data points for the iPhone sample were selected by matching the first data points in the sequence for both technologies, and then collating the remaining data points spaced at regular intervals from the previous data point. Selecting the first data point from the iPhone database was approximate, using a triangulation of measures. Although some uncertainty may remain regarding this first matching, the remaining data points were selected objectively, at exactly one minute intervals from the first one.

#### Materials

- One Spidertracks unit (a commercial GPS fleet monitoring tracking device).
- One iPhone unit with a GPS flight tracking programme installed. The phone was used without
its phone card.
- A stopwatch.

**Data analysis**

- The data matrix was assessed as per normality and linearity. Results were adequate for continuing with parametric data analysis.
- Main analyses were t-tests for paired-samples for the four variables under study.

**References**


**Editor**

Jose D PEREZGONZALEZ (2010). Massey University, New Zealand (JDPerezgonzalez)

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