Analyzing Volunteered Geographic Information Accuracy and Determining its Capabilities For Scientific Research

An Undergraduate Research Scholars Thesis

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What is VGI?
Two Parts

• Building the CatMapper

• Testing the CatMapper
The CatMapper

iOS and Android Mobile Application

- Utilizes Esri SDK
- Android – Java
- iOS – Objective C
How It Works
Testing the VGI Produced by the CatMapper

- Disseminate the application to users
- Monitor the website
- Send out surveys
- Test the location service of the mobile phone
Sharing the Application

- Android- email a link
- iOS- Apple App Store, Ad Hoc Sharing
Monitoring the website
<table>
<thead>
<tr>
<th>I had a good experience using the CatMapper.</th>
<th>I found this mobile phone application convenient and user-friendly once downloaded.</th>
<th>I have prior VGI/GIS/geospatial training.</th>
<th>I used the CatMapper often. (2+ times a week)</th>
<th>I provided accurate and honest results.</th>
<th>I would be willing to download and use applications such as the CatMapper to provide data for scientific research.</th>
<th>I would be willing to help collect VGI data for research and provide truthful results if some sort of incentive was involved.</th>
<th>Comments/Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Strongly Disagree</td>
<td>Agree</td>
<td>Agree</td>
<td>Agree</td>
<td>photos have trouble showing up on iPhones. Interface is simple but fine, gets the job done.</td>
</tr>
<tr>
<td>Agree</td>
<td>Undecided</td>
<td>Agree</td>
<td>Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
<td>Strongly Agree</td>
<td>The points that post to the map are very small. It is difficult to select them.</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>Strongly Agree</td>
<td>Strongly Agree</td>
<td>Disagree</td>
<td>Undecided</td>
<td>Agree</td>
<td>Agree</td>
<td>Instead of dot density, consider graduated symbol map. Number of cats in a single point can be more than one so graduated symbol would more accurately represent the true densities.</td>
</tr>
</tbody>
</table>
Testing the Location Service

• Locate a benchmark in the proper environment
  • Benchmark provides a known location from which to measure

• Take numerous points at that benchmark

• Average the points and measure the distance
Introducing Error

Multipath

PDOP Variability

Area of Uncertainty

Good

Bad
Positional Dilution of Precision (PDOP)

Day 1

PDOP = 1.16

Day 2

PDOP = 1.49
Testing the Location Service
Results

• Functional mobile application

• A larger user group is needed

• Accuracy of locational service is of good quality for our scale of research
Thank you
Are there any questions?