

Statement of Interest in Volunteered Geographic Information.

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For the last 11 years I have been conducting research in the area of Volunteered Geographic Information. Originally my interest focused on the collection of probe data from vehicles so as to build highly accurate and reliable databases of the road geometry and traffic controls in order to support vehicle safety applications. This is a compilation of geographic information provided by vehicle drivers, commonly referred to as probe based mapping. More recently my interest has expanded to include the collection of audio 'stories about places' which can be generated by a community and made available to others with common interests. My interest in this derives primarily from my frustration with trying to read about historical markers and interesting sites while driving by at 65 mph, although I also believe this to be a significant business opportunity.

I will talk about how each of these interests may be addressed in the VGI conference, starting with probe based mapping.

Probe based mapping has the potential to save thousands of lives and billions of dollars a year in the US alone. This is because maps of a sufficient accuracy and reliability can be used to guide vehicles (in combination with adequate positioning systems) and keep them from leaving roadways or running into each other. I believe that other mapping techniques, such as mobile mapping or remote sensing, are inherently prone to human errors and have very long revisit rates, and can never achieve the required reliability and accuracy for the most demanding vehicle safety applications. The statistics of probe based mapping allow for any arbitrary accuracy and reliability, given sufficient number of data samples. In addition, certain information, such as the location of stop signs, is trivial to obtain from probe data, and next to impossible to obtain reliably from other mapping techniques (this latter point was well demonstrated during the Department of Transportation's Enhanced Digital Map project early this decade).

VGI is directly applicable to the collection of this probe data. While there is no effort required by the provider (they merely drive normally), the issues of motivation and privacy are absolutely critical here, and probably more so than in any other VGI situation. Driving data in it's raw form shows every time you should have gotten a speeding ticket or traffic violation, and who's driveway you were parked in last night. Is this liability offset by the possibility of saving lives and helping the transportation system to run better? What sort of constraints or filters can/should be put on the data so that the above nightmare does not become reality?

Issues of the authority of the data are also critical. If we are trying to detect stop signs, how do we deal with data from a driver who routinely runs stop signs? What about the new 'road' appearing in the data from a 4WD vehicle? The industry today is starting to use user feedback to improve maps- both Navtech and TeleAtlas have web pages where one can report a problem, but the data is verified by their trained staff. Google, Tom Tom and Open Street Maps will update their maps based on the data provided. Can we build

a map with the authority of Navteq or TeleAtlas and the cost and coverage of Google?

Recently I started a project (VII) to collect the massive amounts of probe data that will be needed to develop the safety quality digital maps for transportation. This system may be widely deployed in a few years, and yet the questions above still need to be answered if we are to make the best use of this data.

My second interest in 'stories about places' is even more germane to the VGI topic.

I believe that navigation systems in vehicles are incredibly underused- even though they are becoming more and more available, whether from the vehicle OEM, an aftermarket provider, or through a phone. It is very rare that I need my navigation system to find a pizza. It is quite common for me to look at the map on my navigation screen and see an interesting feature, or look out the window and see something of interest, but I have no way to get more information- even though much of that information is on the web! There are two major problems- the data on the web is not geographically indexed (which is rapidly changing) and that the information is not in a form I can consume while driving (i.e. audio). I have been working to solve this problem for about two years.

The way to solve this problem is to create a new community of geo-audio content and make personalized selections available while driving. If everyone would go to a website and identify the six most important places in the world to them- and then tell the story of why they are important, the content would be fascinating. Content can be indexed and tagged using the standard web 2.0 methods, and then selected based on an individual's interests. The audio files can then be transferred to a vehicle, and made available in that generally low value (although often pleasurable) time behind the wheel. The problem is getting a critical mass of content so that there is enough content to keep most people interested. This reflects one of the key problems in any VGI system- how to reward contributors for their data? This is especially true for the creation of audio data, which is less familiar to many people, and, arguably, more difficult for most to do publishably well.

I hope that by attending this conference, I will gain more insight into some of the questions identified above.