Quality Aspects of Crowdsourced Geographic Information for Emergency Response

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Abstract: Facilitated by the proliferation of the internet and the massive use of location-aware devices, we have been witnessing an enormous growth in the volume of location-specific information provided by individuals through various online platforms and networks (e.g. social networking sites and web mapping services). Despite the potential benefits of this new type of data, there are, however, barriers and challenges preventing it from being accepted by the authorities and government as the reliable and credible source for information, especially in emergency response and disaster management contexts. This research is looking for implementable processes that can enhance the quality aspects of crowdsourced geographic information and turns it into a more reliable source of data for various kind of application.

Introduction

Crowdsourced Geographic Information opens up the opportunity of accessing and exploring the wide range of potentially useful, cost-effective and spatio-temporal data for many areas of application, particularly in time-sensitive contexts such as disaster response. However, there are still plenty of uncertainties and significant challenges to overcome in effectively utilising such data as a trustworthy source of information.

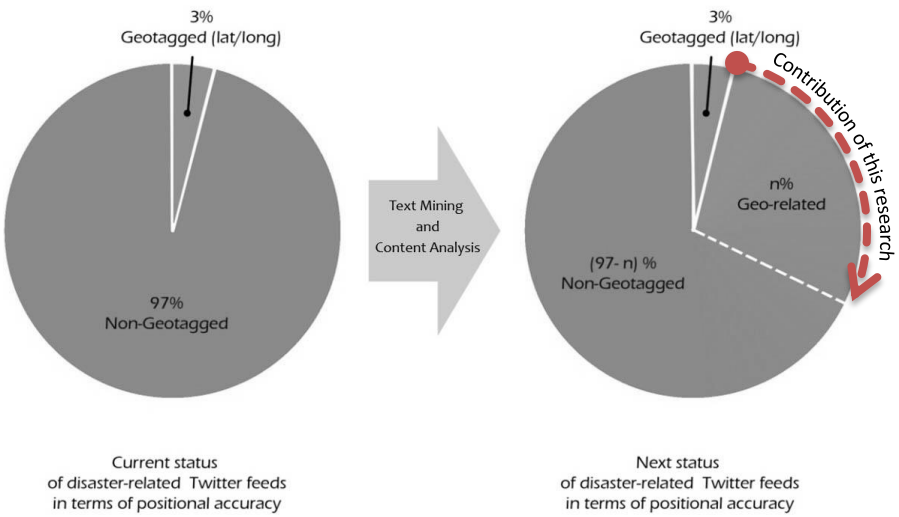
This research aims to develop a framework to address the existing challenges then will try to focus on locational ambiguity and positional accuracy of crowdsourced data as one of the key issues of the crowdsourced information. Twitter is chosen as the case of this research. Geo-tagging is an opt-in service and location of tweets are as uncertain or definite as the user would like and only 1~3 percent of tweets are geotagged. Thus, the "Positional Uncertainty" and "Locational Ambiguity" of tweets significantly influence its reliability for emergency response.

Methodology

Though majority of the collected Twitter feeds have no attached coordinate information, they can be potential source of valuable information. In other words, just because %97-99 feeds are not geo-tagged, doesn't mean that they don't have anything about their location in the content. In this regard, focusing on tweets' content and trying to extract the locational information through content analysis and text mining can be considered as a potential method to generate the geometric component for non-geo-tagged tweets.

Conclusion

Taking non-geotagged crowdsourced data (tweets) into account as the potential carriers of geo-information and implementing text mining and content analysis methods to acquire the geo-information of publicly available feeds, could possibly enhance the overall positional accuracy of crowdsourced data and turns it into a more trustworthy platform to harness collective intelligence for emergency response. Further discussion and practical outcomes are yet to be explored and determined.



Current status of disaster-related Twitter feeds in terms of positional accuracy

Next status of disaster-related Twitter feeds in terms of positional accuracy