Situational Awareness: Using Twitter Geolocated Tweets and IBM Watson on a Mobile Device.

Research Proposal

Isaac Callison (ic2d@mtmail.mtsu.edu)
Middle Tennessee State University

February 29, 2020

1 Introduction

What situations are you walking into? There is a convergence of powerful technologies that allow for near instantaneous notification of current events. Can a mobile device leverage geolocateed tweets from Twtter, and analysis from IBM's Watson, to produce real-time notification of potentially hazardous situations? That is what this reasearch proposes to elucidate.

2 Specific Aims

- Access the developer consoles and APIs of Twitter and IBM Watson to see if the two technology giants can mesh
- Create an android app that pulls in geolocateed tweets that IBM's Watson can analyze for sentiment and emotion.
- Show a user's current location, and potentially dangerous proximal locations, in a google map on a mobile device.

3 Background

There will be several interdependant moving parts with this project. The datasets for the natural language processing will come from Twitter. The Twitter API allows for the triangulation of geolocated tweets[4]. Using developer authentication, and a GET request with certain location parameters, one can obtain a list of current tweets within a search radius in JSON format. From these tweets one can glean a myriad of data.

The android application will track the user's longitude and lattitude in real-time. A mobile phone is useful in this regard because of the built-in sensor data that can accurately locate the position of a user. Using this data, tweets will be obtained from a given radius around the user.

The last part of this project is natural language processing with IBM's Watson. IBM has an easily accessible cloud computing program with various machine learning capabilities[2].

The code for the Android Application is located on Github. While it is not eligible to be uploaded to the Play Store yet, it may be tweaked and uploaded in the future[1].

4 Preliminary Results

A few steps have already been implemented to see this project to fruition. Both IBM's cloud machine learning service and Twitter's API require developer accounts and some pre-approval. These credentials have been secured. Postman, a REST API testing software has been used to experiment with Twitter's API[3]. Further, a skeleton android application has been created and uploaded to Github. To date, this application just obtains and tracks the user's current position.

5 Work Plan

The mobile application is the nexus of this project. Moving foward attempts will be made to integrate calls to the twitter API using the credentials referenced earlier. Passing in the user's lattitude and longitude should yield tweets that can then be parsed. IBM provides a Watson Software Development Kit for integration into the Android Platform. The text from the obtained tweets will be passed into Watson for natural language processing.

5.1 Aim 1: Hardware Implementation

5.1.1 Objective

- Method:
- Method:

5.1.2 Objective

- Method:
- Method:

5.2 Aim 2: Node Swarm

5.2.1 Objective

- Method: Aim.

5.2.2 Objective

- Method:

5.2.3 Objective

- Method:

6 Broader Impacts

References

[1] Callison, I. Danger Floof: Android Studio Project. `https://github.com/cthulhu1988/DangerFloof`, 2020. [Online; accessed 26-February-2020].

[2] IBM,. IBM's Watson: Cloud Computing. `https://cloud.ibm.com/`, 2020. [Online; accessed 26-February-2020].

[3] Postman,. Postman API. https://www.postman.com/, 2020. [Online; accessed 26-February-2020].

[4] Twitter,. Twitter Documentation: Geocode API. https://developer.twitter.com/en/docs/geo/places-near-location/api-reference/get-geo-search, 2020. [Online; accessed 26-February-2020].