VTIS: A Volunteered Information System

Roland Varriale, Adviser: Dr. Ouri Wolfson

The University of Illinois at Chicago

UIC COLLEGE OF ENGINEERING
UNIVERSITY OF ILLINOIS AT CHICAGO

Abstract

We have devised a system that will generate personalized notifications for users based on a provided path, temporal range, and set of transportation modes. At a high level, the functionality of this system is to identify events that affect the user's route and notify the user of these events. The VTIS will provide a robust multimodal notification system based on information from several sources. This information will be combined to create a spatiotemporal database of transportation events, which may be queried to notify affected users. Users will create routes through the VTIS by specifying a series of directions. The user will then be notified if any transportation event will have an effect on the user's experience during that route.
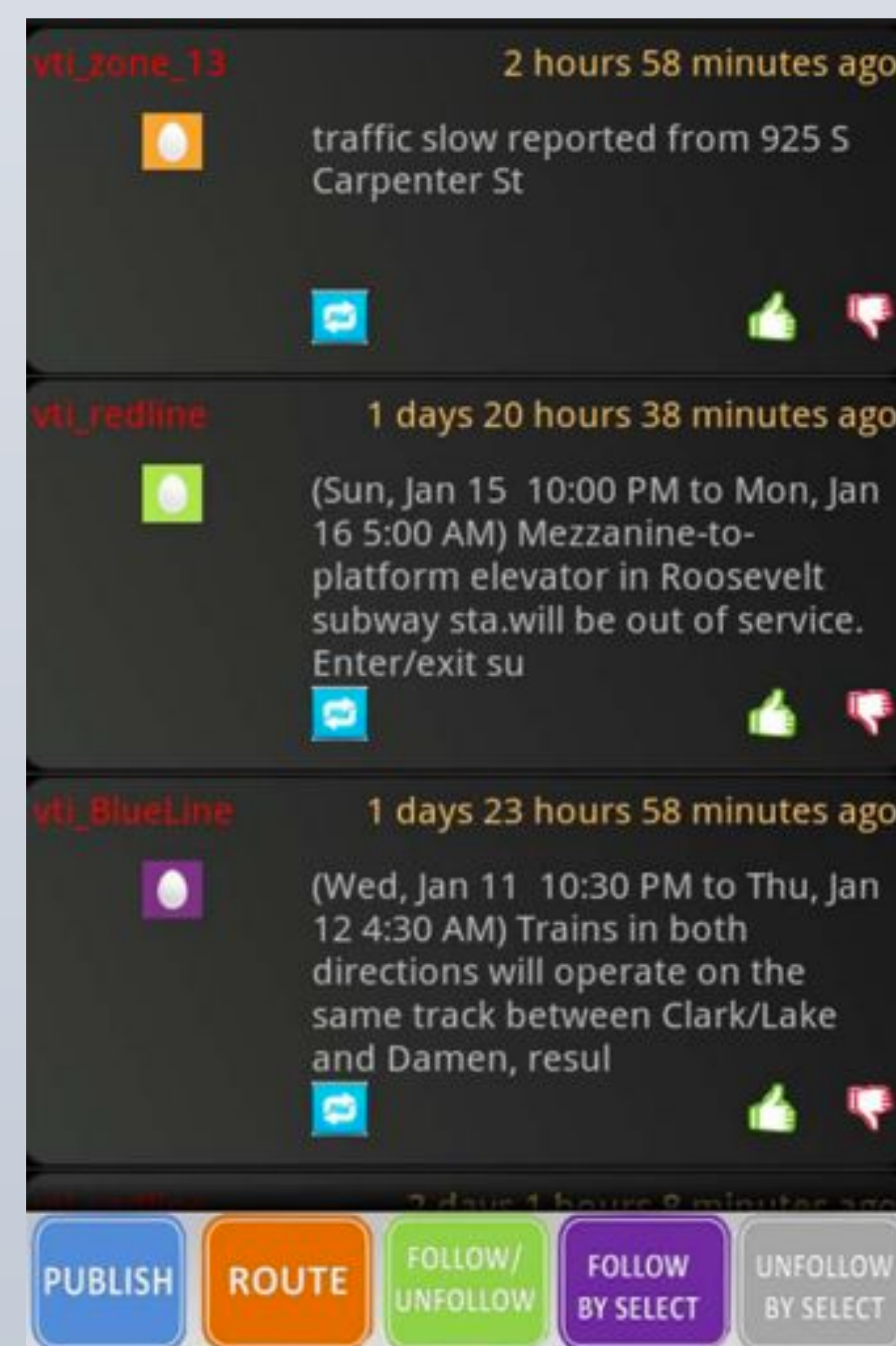
Objectives

Create an infrastructure conducive to the retrieval and contribution of transportation events

Mined Twitter data to create a real time, multimodal notification system

Use machine learning techniques to accurately retrieve tweets related to transportation events

## Application Screen Shot

Route Creation

The user will specify a route in a similar fashion to Google Maps, in terms of legs of a trip

From these legs a multimodal route will be constructed and stored within a spatiotemporal database

This route will be used to notify the user of any transportation events that occur along or close to their route that may affect their travel time.

The user must also specify some amount of tolerance to transportation events they wish to endure. This will be used to fine tune their notifications.
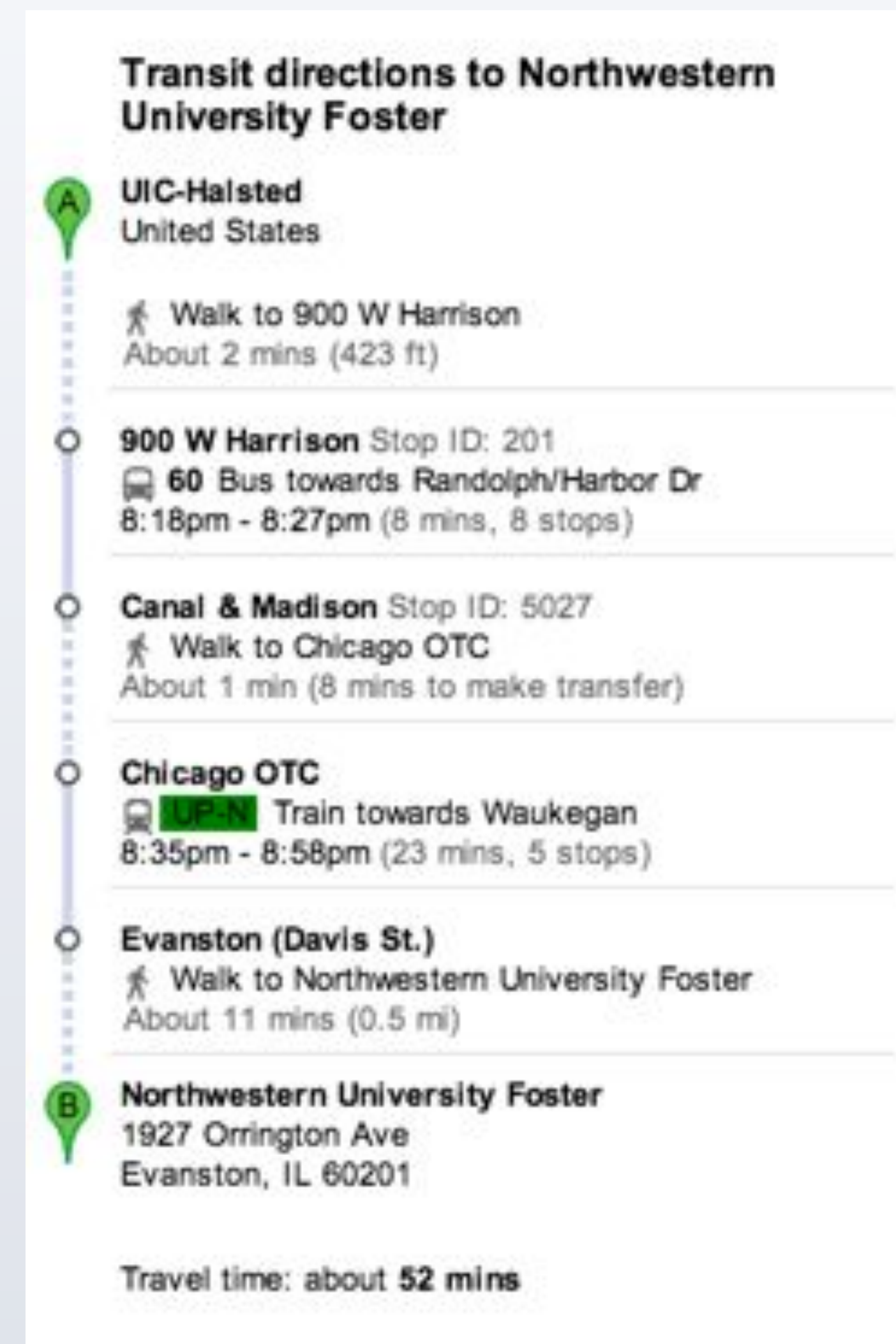
Obtaining Twitter Data

For larger cities there are authoritative Twitter accounts that tweet important information.

By using a combination of string searching and machine learning techniques we can isolate accounts that tweet transportation events.

Once transportation event related tweets are identified necessary information such as location, event type, and mode are extracted.

A query is then triggered in the spatiotemporal database.

Event Propagation

We define a function P that will take in two parameters: a mode and an event; and will generate an intensity that will propagate some distance, d. This will calculate the affect of the event for each mode of transportation.

Each event will have an epicenter which corresponds to the event's location, and a locus which increases in distance from the epicenter linearly with respect to time

If the user-specified threshold is met, then a notification will be generated.

Each event will trigger a query within the database and retrieve any routes with a threshold less than the intensity of any event intersecting that route