RAPID Awards Presentations
Information Technology Group

Airborne Imagery to Locate Shelters & Asses Debrif
Harvey Rhody, Rochester Institute of Technology

Supporting Family Reunification after Haiti Earthquake
Chen Li, UC Irvine

Mobile Technollogy for Haitii Relief
Kevin Meehan, University of Central Florida

An IT Infrastructure for Classifying Tweets and Messages
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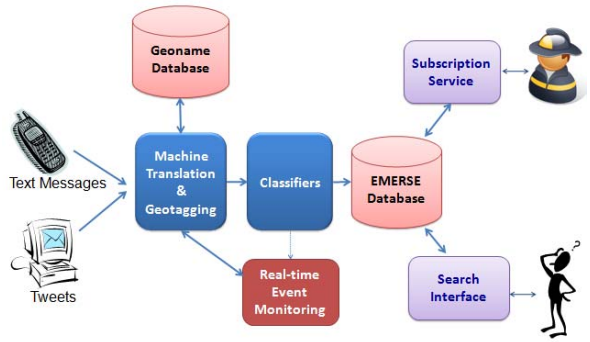

Models of Social Contagion of Sentiment Towards Haiti on Twitter
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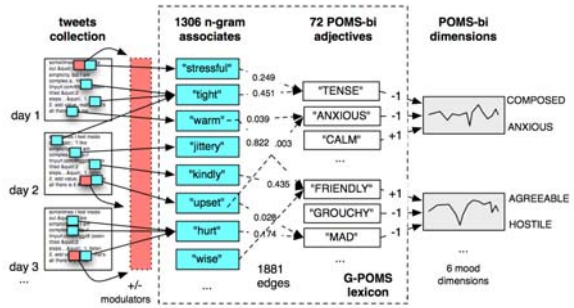

Project Description/Goals

Harvey Rhody and Robert Krzaczek
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To investigate techniques to provide information from airborne remote sensing platforms in a timely and useful manner to local disaster responders.

- Build and evaluate a tool that can process airborne imagery to locate temporary shelters being used by victims. This will be used to locate groups of internally-displaced persons (IDP).
- Investigate how information like this will be accessed and used by responders.
- Suggest guidelines for user interaction with such IT tools.
- Describe system design goals and constraints for rapid delivery of information in a form that is useful to responders.

Initial Findings

- A detection algorithm for temporary shelters is feasible, based on color detection with standard RGB imagery.
- Because data processing will often depend upon specialized algorithms and image processing knowledge it is desirable that it be done with the help of people with appropriate expertise.
- The data cycle between collection, transmission to a processing center, determination of appropriate processes, and delivery of results to the responders in a timely and useful fashion is a challenging IT design task.
- See poster for more details.

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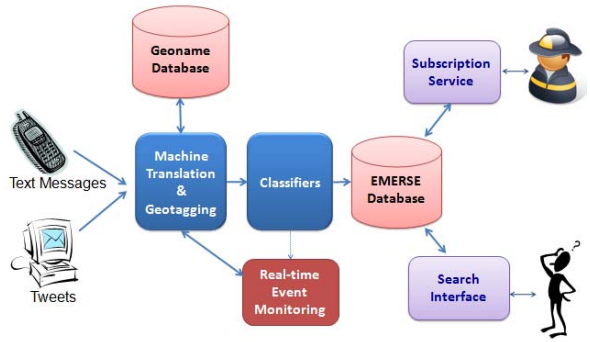

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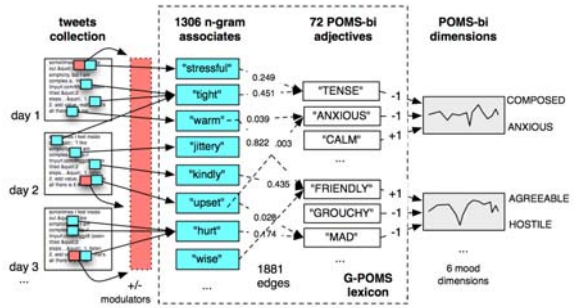


Assessing Current and Potential Uses of Mobile Technology for Haitian Relief and Development Efforts

Participating Institutions

University of Central Florida

University of Nouvelle Grande'Anse
Jeremie, Haiti

University of Fondwa
Leogane, Haiti

Project Goal

To assess the potential for **mobile communication** to enhance **interagency coordination** between stakeholders both during and after the crisis. We used quantitative and qualitative metrics to measure alignment of goals, competitiveness, mutual respect, barriers to coordination, normative practices for communication and information flows, and perceptions about mobile communication technology.

Data Profile

- 220 structured surveys
- 43 semi-structured interviews
- 18 responding agencies
- 5 regions (Port-au-Prince, Leogane, Fondwa, Jacmel, Jeremie)
- 91 agencies rated
- 3:41 video http://vimeo.com/13661823

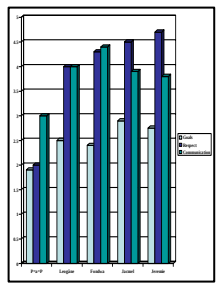
Assessing Current and Potential Uses of Mobile Technology for Haitian Relief and Development Efforts

Initial Findings on Mobile Tech

•Mobile service restored 2-7 days.
•Low awareness of mobile apps, e.g., Ushahidi, but high interest in learning more.
•Moderate to high level of comfort with and confidence in mobile technology.
•Radio and internet for gathering information.
•Cell phones to mobilize formal and informal support networks.
•Haitian cultural context. Mobile devices (particularly in rural areas) blended with traditional patterns of information flow: foot travel, word of mouth, *teledjol*; less clear how mobile devices shape those traditional patterns of information flow.

Initial Findings on Coordination

•Agency goals were relatively non-aligned across agencies and regions
•Survey responses on respect and communication varied widely in Port-au-Prince, suggesting snafu conditions in the city, but were more consistent in other regions, suggesting more harmonious dynamics in the countryside.
•"Bad road conditions" was listed most frequently as the principal barrier to coordination.



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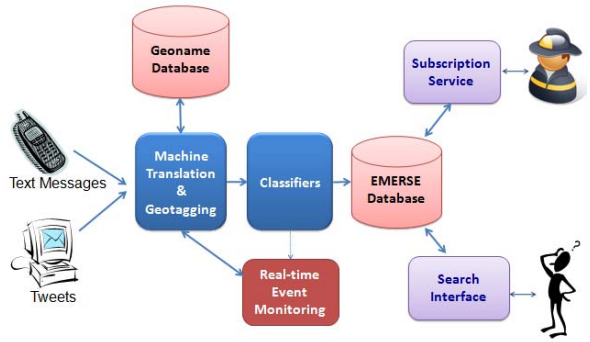

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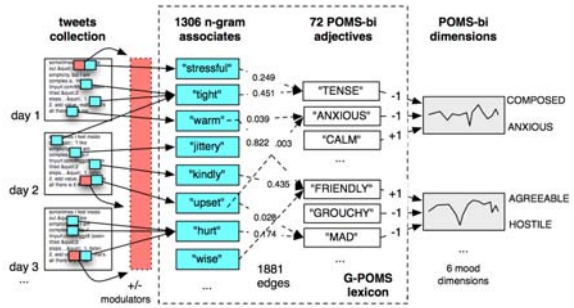

Supporting family reunification after Haiti earthquake
Chen Li, UC Irvine

- Many people looking for information about their loved ones after disaster
- Important to help these families reunite
- Many Web sites provide information about missing people, e.g., http://www.familylinks.icrc.org/haiti/people
- It's hard to find information from various sources
- Our goal:
  - Make it easy to obtain and integrate information from these autonomous web sites
  - Provide powerful interfaces to help people search information

Initial Findings

- Developed a web site to collect people information from Web sites: http://fr.ics.uci.edu/haiti/
- Contributed data to the Google Person Finder site: http://haiticrisis.appspot.com/
- Built powerful search interfaces: http://fr.ics.uci.edu/haiticrisis
- Search widget used by other sites: http://www.miamiherald.com/news/americas/haiti/connect/
- Studying how to make the search more powerful on the Person Finder site (on Google App Engine)
- Studying how to do location-based search (e.g., on maps)

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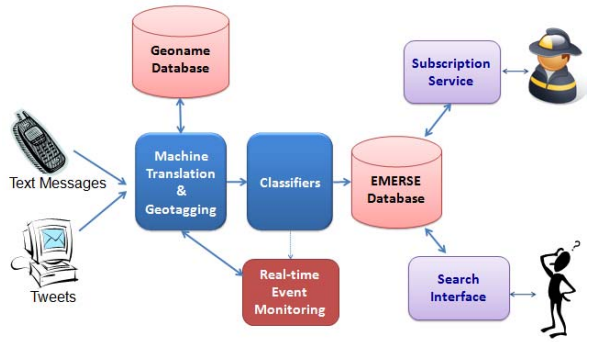

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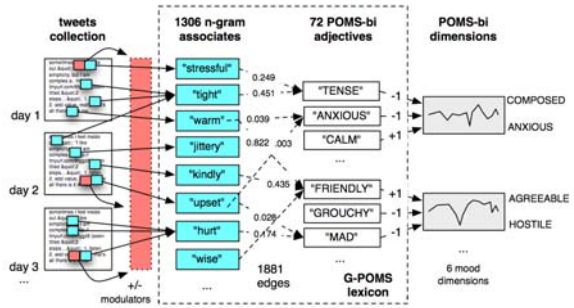


EMERSE: Enhanced Messaging for the Emergency Response Sector

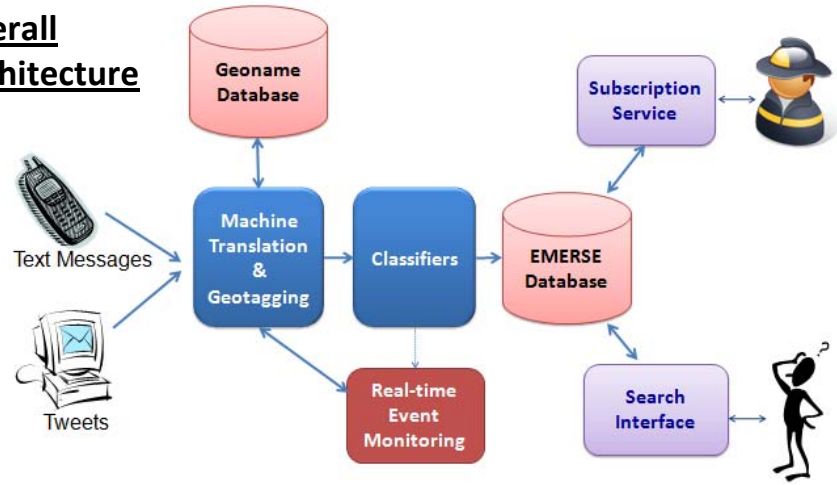
J. Yen, C. Caragea, HW. Kim, P. Mitra, C.L. Giles, A. Tapia, B. Jansen, D. Wu, A. Jaiswal, G. Traylor, A. Maslowski, LM. Tchouakeu
The Pennsylvania State University, Tel. (814) 865-6174, E-Mail: jyen@ist.psu.edu

Motivation

Classifying tweets/messages automatically into categories and delivering them to NGO's and relief workers would enable them to respond and to collaborate more timely and efficiently.

•Opportunity: Large amounts of tweets and text messages about Haiti earthquake, which need to be translated, geotagged, classified and aggregated.
•Challenges: Text messages are short and may belong to multiple categories. Labeling them is time consuming and error-prone.
•Needed: Designing a better feature representation is important to improve the performance of machine classifiers.

Overall Architecture



Scientific/Technical Approach

•Adopt the categories of Ushahidi
•Use Ushahidi reports as training data
•Explore multiple machine learning algorithms for classification
- Support Vector Machine, Random Forest and Naïve Bayes
•Multiple Feature Representations
- Feature Abstraction (FA) (i.e., clustering "similar" features)
- Feature Selection (FS) using *Relief* feature selection
- Topic Word (TW) Selection using Latent Dirichlet Allocation
- Bag of Words (Unigrams)

Accomplishment

•Demonstrated feasibility using Ushahidi reports
•Identified the importance of feature representation

Future Directions

•Enrich features with semantic knowledge
•Context-aware classification and event discovery
•Deployment and Evaluation of EMERSE Mobile
•Cloud computing-based infrastructure

Project Website

http://emerse.ist.psu.edu

Haiti RAPID and Research Needs Workshop
Arlington, VA Sept 30/Oct 1, 2010

Initial Findings

Average F1-Measure obtained in 5-fold cross-validation using Support Vector Machines (SVMs) with four feature representations: a bag of words (BoW), feature selection (FS), feature abstraction (FA), and topical words (TW).

1.Text messages about food distribution are harder to classify than others.

2.Feature abstraction (FS) can yield better classifiers than those obtained by the three other feature representations.

Class	BoW	FS	FA	TW
People Trapped	0.68	0.71	**0.74**	0.72
Food Shortage	0.71	0.72	**0.74**	0.73
Food Distribution	0.27	0.25	**0.27**	0.26
Hospital Services	0.56	0.57	**0.59**	0.57

Closer look at examples in Food Distribution:

We in Canada turjo quote, we need food, water and tents. count on your participation., Food Distribution

High similarity

Good evening ONG, I'm very happy for the aid you're giving to the people, I thank you. But in my zone that's to say Lamenten 54 Rue St Juste we need shelter and food., Food Shortage

Possible errors in labeling.

High overlap with the food shortage labeling

Future Work: Enrich the representation with expressive features from large external data sources!

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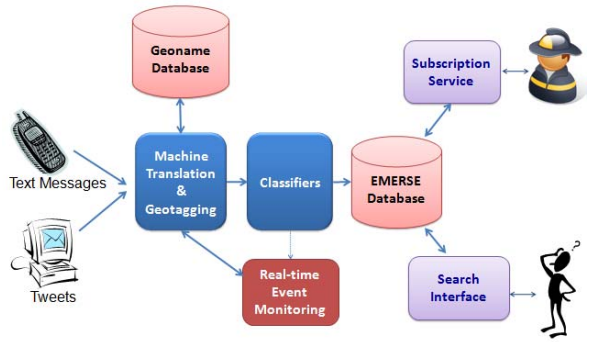

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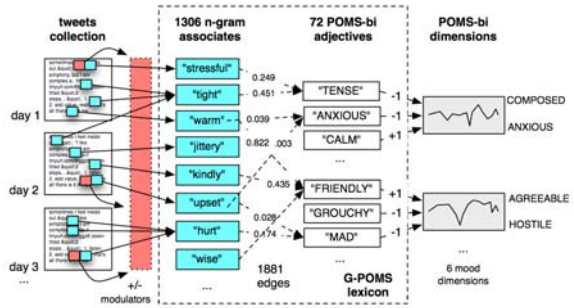

RAPID: Models of social contagion of charitable sentiment towards Haiti on Twitter.

Johan Bollen (PI), Eliot Smith (co-PI) and Peter Todd (co-PI)

Problem statement:

- Online social networking shapes our social and emotional lives, public responses to external events
- Charitable response to Haiti disaster greatly affected by Twitter.com
  - Social networking: user1 <follows> {user2,…}
  - Mood and sentiment: online expressions
- Objective: study effect of online social networking and emotions on pro-social behavior with regards to humanitarian disasters:
  - Use sentiment tracking techniques
  - Complex network models: contagion and diffusion of information and mood states
  - Identify intervention techniques to optimize pro-social behavior

```
[user]: I made my donation to help those in
Haiti. I feel good that I am helping. You
should do it too! They need our help.
[user]: @[friend] is making me feel guilty
for moaning about my life with the haiti
situation, I will stop moaning and be a
good human.
[user]: @[friend] Thanks Eloisa!! Just
donated to Haiti Earthquake Relief thru
SMART. Ive been feeling crappy today, feel
much better now. :)
```


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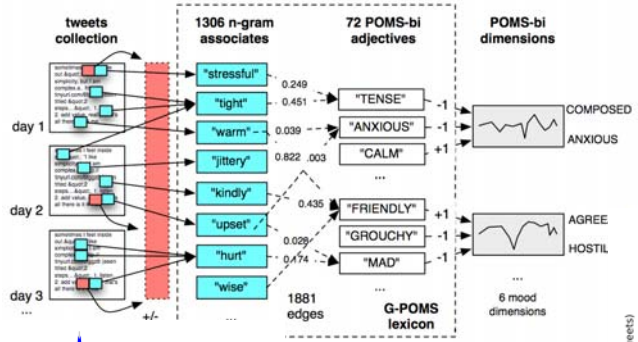
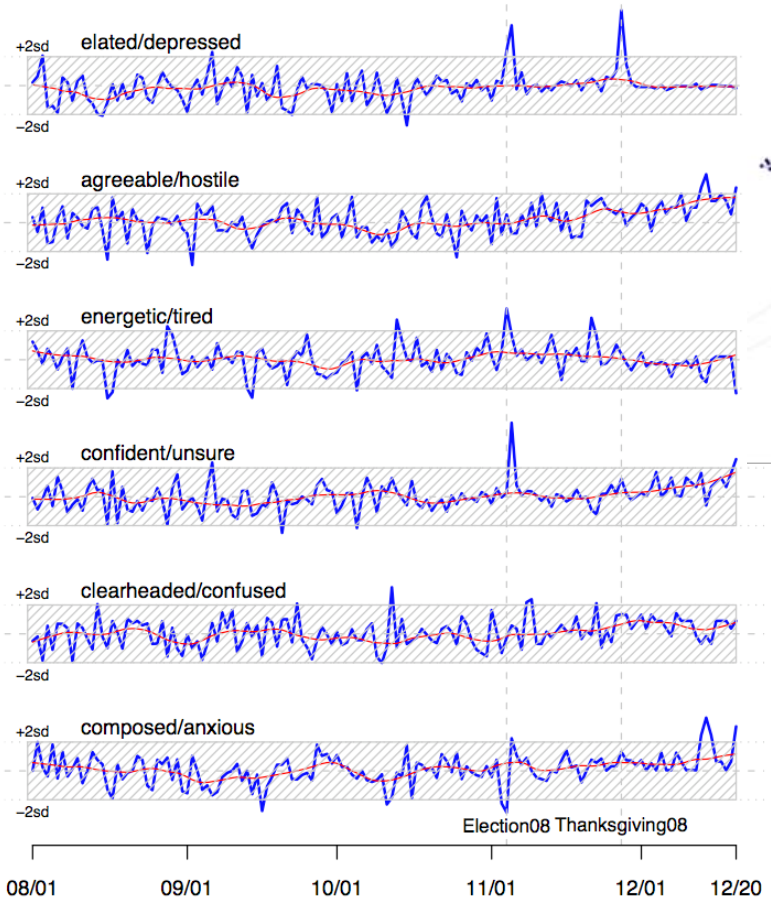
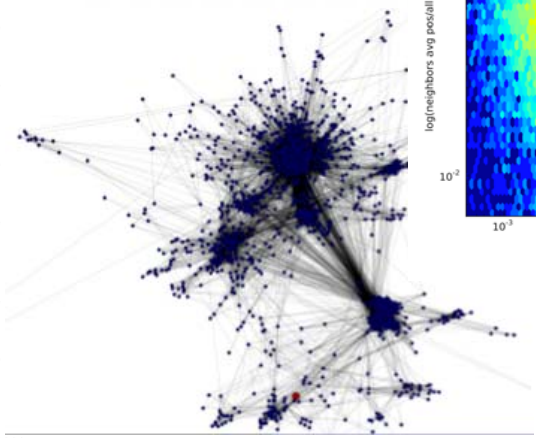
Methods

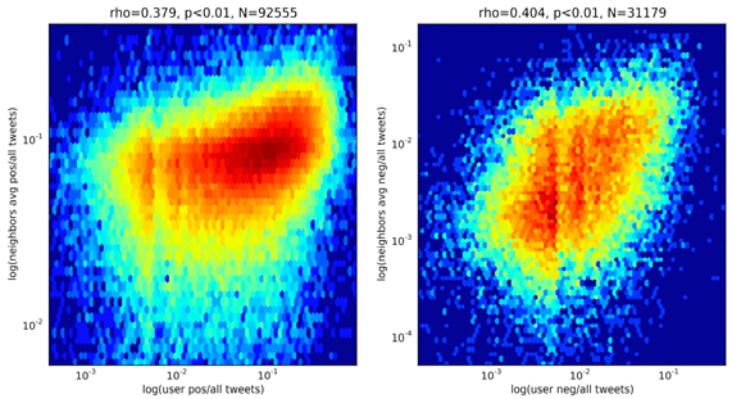
1) Large-scale sentiment tracking of Twitter mood states using modified psychometric instruments





2) Studying contagion of mood states across Twitter social network





3) Studying effect on pro-social behavior

Truthy.indiana.edu

Relevant publications:
http://informatics.indiana.edu/jbollen/Publications.html

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