

CSE 490D + HCDE 496/596 - Winter 2013 - Potential Projects

1. Mobile Application for Tweak the Tweet (an innovation that facilitates citizen-reporting and crisis-mapping during disaster events): Design a mobile app to facilitate citizen reporting from the ground of crisis events. This idea can be based on the Tweak the Tweet concept, a proposed microsyntax for reporting data via Twitter during disasters. Tweets using TtT syntax can be easily processed, categorized, and mapped. However, it is currently difficult for those affected by crisis events to use TtT syntax. Your task would be to design an application that facilitates the creation of tweets (by affected people, during disasters) that can be easily processed. (Sponsor: HCDE Prof. Kate Starbird)

2. Support Social Media Curation by Digital Volunteers: In recent disaster events, remote volunteers have begun to self-deploy onto the virtual scene of disasters, assisting in response efforts often through information-processing tasks. One way that these digital volunteers contribute is by sifting through the massive amounts of social media posts and identifying actionable information. Many digital volunteers have adopted the Tweak the Tweet syntax for their curation and crisis-reporting activities. This project will focus on building tools to help digital volunteers deploy Tweak the Tweet for response efforts all over the world - helping them deploy Tweak the Tweet themselves (make it sustainable). Aspects include capturing and processing TtT tweets (and possible information from other platforms - e.g. Instagram), and designing how information from these tweets is passed on to responders and affected people—e.g. crisis maps, location-based feeds, other visualizations. (Sponsor: HCDE Prof. Kate Starbird)

3. Persuasive Gaming for Disaster Preparedness: Create a mobile, location-aware, social media-connected game to encourage disaster preparedness. Preparation might not be the “sexiest” aspect of disaster response, but it is perhaps the more critical phase for saving lives. This project, connected with emergency managers in Clark County, WA, seeks to help a community prepare for disaster through persuasive technology in the form of a game. *Think “fitbit” for disaster preparation.* See Battlestorm, deployed in Biloxi and funded by the Knight Foundation. From emergency manager Cheryl Bledsoe: “Southwest Washington is a bustling metropolis with a myriad of natural disaster threats like earthquakes, volcanoes, severe storms, and hurricane force winds. Throw in a risk of terrorism, both foreign AND domestic...and we have 435,000 people here who need to get themselves ready for anything. To help our community and others prepare for disasters, we started a little game called 30 days, 30 ways. Since 2010, we have spent each September posting a task for our community to ponder and answer...for 30 days straight. In the first year, 608 tasks were answered and completed. In the 2011, 2411 tasks were recorded and in 2012, over 4,500 tasks were reported from players in 26 states and 6 countries.” Your task would be to redesign this game, transforming it from an offline game to an online one, bringing it into the realm of social media, mobile computing, etc. Design goals include making the game more collaborative and social and having the solution be easily adapted and exported to other communities. (Sponsor: Cheryl Bledsoe, Emergency Manager)

4. Neonatal nurses - Neonatal care education tool for nurses who are not used to taking care of neonates but have to step in occasionally. Encode neo-natal care protocol within ODK for fast access to relevant issues and connect to videos/graphics of relevant procedures.
(Sponsor: Jocelyn Kirk, UW School of Nursing)

5. Improving self-management for patients with depression, diabetes, and low health literacy with mobile technology - Can patients with depression and diabetes use a mobile health disease management application to improve treatment engagement, adherence, and outcomes? Develop a patient-centered mobile health application to extend the collaborative care model and enhance its ability to provide real-time monitoring and just-in-time interventions, and further individualize and intensify treatment. A long-term goal will be to interface the patient mobile health app with the web-based patient registries that are used in large scale collaborative care implementation programs to provide clinicians with direct access to this data.
(Sponsor: Dr. Amy Bauer, Psychology)

6. Peace Corps - The goals of the "weReport" project is to create an application that will allow recipients of international development projects to report on the effectiveness, timeliness, equitability, and community inclusion of the projects. This is critical, because every year, millions of dollars are wasted by donor organizations on projects because they did not adequately involve community members in the process. The bottom line is that this application would allow recipients to honestly report before, during, and after the projects, resulting in organizational accountability and swifter, more accurate allocation of resources and assistance.
(Sponsor: Jaron Reed, Hutchinson Cancer Center)

7. iRespond patient identification - Local NGO in Belltown seeks to develop a way to unambiguously identify patients in the field in Myanmar without relying on a synchronous connection to the Internet. Biometrics (fingerprints, facial ID, etc.) are a possibility as are social challenge/response questions (e.g., who is your next door neighbor, how old is your father).
in belltown, patient ID using biometrics, iris, facial ID
(Sponsor: iRespond)

8. ODK Tables Map view - ODK Tables is a tool in the ODK tool suite that allows for the browsing and editing of tabular data. It also supports HTML/JS views of that data. We want to add a "map view" based on cached maps (from Google or OpenStreetMap) and provide search primitives on the map (draw a bounding region with a search condition) and overlay these primitives for more sophisticated searches.
(Sponsor: CSE Prof. Gaetano Borriello)

9. Empty space mapping - Create an app that permits users to quickly map out (using GPS) a new area not on existing maps (e.g., new refugee camp, shanty town, etc.). It should be easy to enter all basic map features - roads, buildings, points-of-interest - and their properties. Projects related to this are Map Kibera and LocalGround.
(Sponsor: CSE Prof. Gaetano Borriello)

10. New widgets for ODK Survey - ODK Survey is a new ODK tool that supports data collection using a highly configurable HTML/JS rendering. We want to develop a large collection of data widgets that allow users to enter complex data types (e.g., region of a map, path through a forest, etc.).

(Sponsor: CSE Prof. Gaetano Borriello)

11. Actuation/sensing from a mobile device - Mobile devices have a rich set of sensors but lack many actuators. We already have a compact interfacing board, called FoneAstra, that should allow a phone to actuate an external device. We want to develop some basic primitives for actuating local heating or position/motor control for the purposes of manipulating samples in rapid diagnostic tests. This would involve collaboration with researchers in BioE.

(Sponsor: CSE Prof. Gaetano Borriello)

12. Orthogonal data collection - Most data collection creates a new entry in a table (a new “row”). Often, however, we want to collect the same data for a set of entries already in the system (e.g., adding a new “column”). We want to develop a new form-based method for quickly filling in the data in columns rather than rows. This would be integrated with ODK Tables and ODK Survey.

(Sponsor: CSE Prof. Gaetano Borriello)

13. SMS for ODK Tables - Provide an SMS interface to entering and querying data in ODK Tables. This work has been started but needs lots of refinement. This project is closely related to Tweak-the-Tweet above.

(Sponsor: CSE Prof. Gaetano Borriello)

14. Benin Cold-chain Logisticians - field logisticians keep track of resources available by continuously updating a large data set representing past data. The goal is to keep the data as close to reality as possible. This project would involve working with folks at PATH and Benin to make sure the entire process (data browsing, data updating, and data synchronization with the cloud) is as smooth as possible.

(Sponsor: CSE Prof. Richard Anderson and PATH)

15. Autism support tools - Autism affects many children across the world. Teachers and caregivers need tools to document and assess behaviors as they occur. This project would involve the adaptation of ODK tools for this task. A “Hack Autism” event will be occurring on the UW campus in early March in which teams will try to quickly write example apps. This is good ideation but requires more sustained effort to get right.

(Sponsor: James Maiocco, Bing Fund)

16. Identifying suspicious data in mobile data collection - Ben Birnbaum’s thesis work determined that it is possible to detect faked data with high accuracy. This project would involve embedding Ben’s algorithms in a back-end data collection repository (such as ODK Aggregate) and providing supervisors with a setup and monitoring dashboard.

(Sponsor: CSE Post-doc Brian DeRenzi)

17. WebQ for ODK - Adapt UW Catalyst WebQ survey design tools to generate forms for ODK Survey so that form authors can graphically design simple forms. This would involve working with the UW Catalyst team and modifying the back-end of their system to deliver the appropriate JSON data structure that can be compiled into ODK Survey forms.

(Sponsor: CSE Prof. Gaetano Borriello)

18. Village Phone Mule - Many rural villages have limited cellular connectivity. Develop an app that allows villagers to ferry others messaging/phoning requests to an area where there is connectivity and bring the results back. Work with mobile money systems (such as mPESA) to implement accounting for the service.

(Sponsor: CSE Prof. Gaetano Borriello and Aptivate)

19. Phone-based Doctor's Kit - Develop phone-based exam kit for eye health based on adapting technology from MIT's Media Lab (Prof. Raskar's group). This would involve eye examination protocols and measurements done with the phone's camera. It would involve determining precise needs and identifying available components to be brought together.

(Sponsor: CSE Graduate Student Nicki Dell and PATH)

20. SpiroSmart on Android - Port the SpiroSmart lung function measurement from iPhone to Android and reverify its correctness. Create it as a separate app that can be called by ODK Survey through the Android intent system.

(Sponsor: CSE Graduate Student Mayank Goel)

21. Port ODK Survey to iPhone or WindowsPhone - ODK Survey is written using WebKit and an Android-specific wrapper for managing files and intent calls. A new wrapper will be necessary to run the same code on different smartphone platforms. The WebKit portion should be more-or-less the same.

(Sponsor: CSE Prof. Gaetano Borriello)

22. Extending and applying ODK Scan - Applying ODK Scan to a Gates Foundation project for surveying slum dwellers. This would involve a multi-page form filled out with pencil marks. ODK Scan automatically converts bubble and checkbox fields and provides snippets of text fields that need to be converted manually. There are both phone/tablet and desktop versions of ODK Scan along with data entry/correction procedures. This would involve close work with a specific NGO to deploy and test this in the field.