Capacity Building in Security, Privacy and Trust for Geospatial Applications

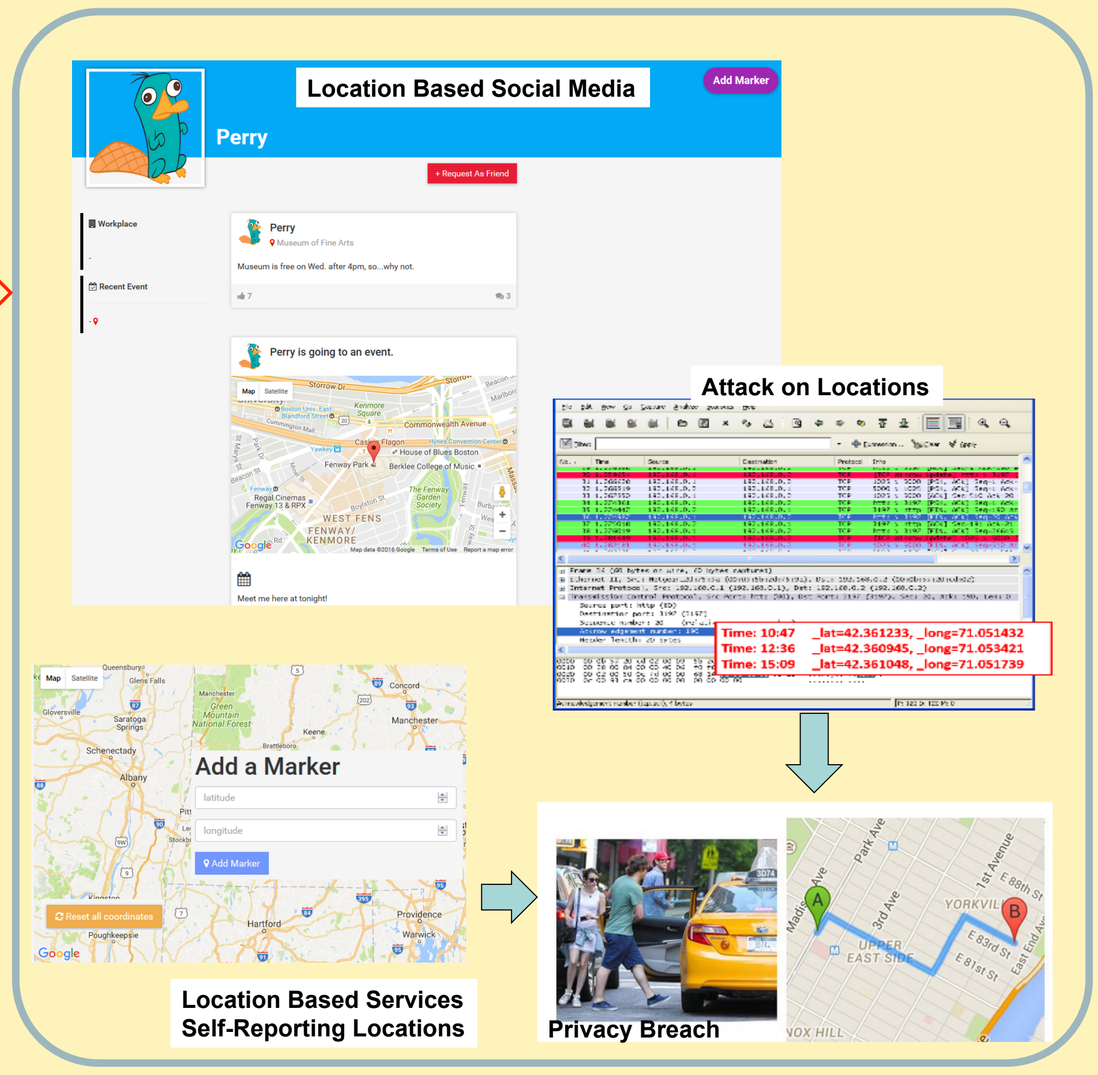
PIs: Gabriel Ghinita, Dan Simovici (UMass Boston)

http://geospt.cs.umb.edu

The project develops educational materials and tools that will help integrate the important emerging topics of Security, Privacy and Trust (SPT) for geospatial data within the curricula of universities and community colleges across the country.

Mobile computing makes extensive use of locations to provide users an enhanced and personalized experience.

But, uncontrolled access to locations can have serious consequences on users!



- Geospatial SPT research results exist, but course curricula presence is scarce, and limited to special topics.
- We develop several course modules and educational "capture-the-flag" style games focused on geospatial SPT.
- Emphasis on rich visual and interactive component that appeals to broad range of students.

Project Components

Course Modules

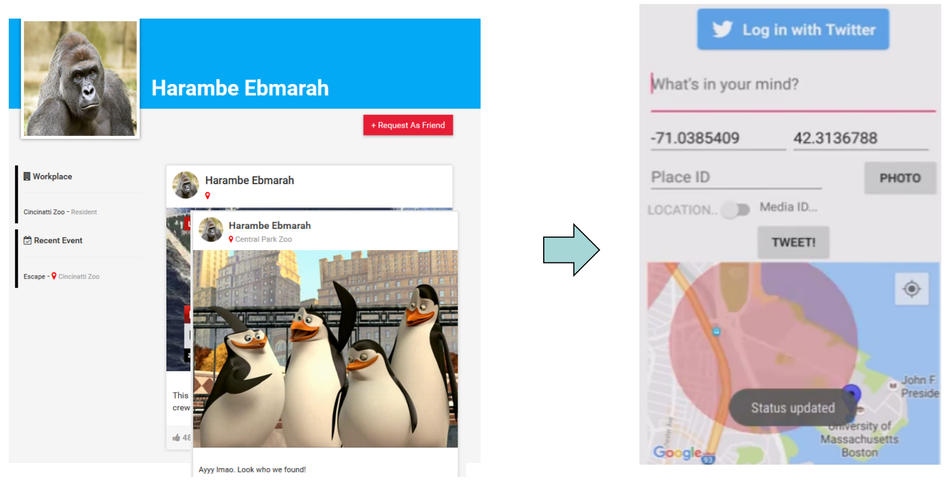
- Both undergraduate and graduate modules.
- Additional module focusing on community college and high school students.
- Integration with diverse courses: security, mobile app development, databases, ethics and data mining.

Educational Games

- "Capture-the-Flag (CTF)" style game.
- Players "hunt" for location data in social media apps.
- Highlights dangers of location privacy attacks.
- Multi-level, targeted at broad audience, from high-school students (with some computer background) to CS majors.

GeoCTF: "Capture-the-Flag" style game

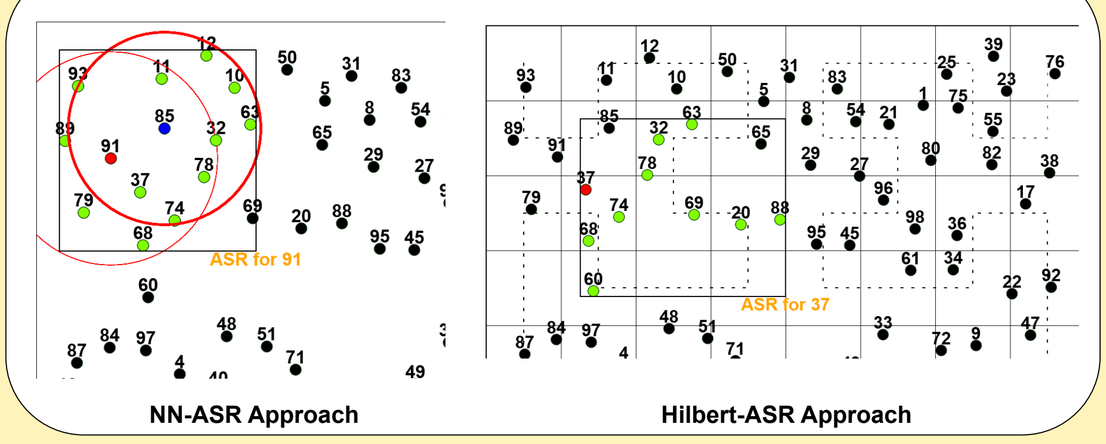
- Mock-up social media website with embedded geotag "flags"
- Integration with Twitter
- Monitoring online user activity and tracking
- Broad range of profile themes catering to audiences of various ages and backgrounds



Users' Online Activity — User Tracking

Location Privacy Protection Techniques

- Rich and interactive visualization tools for prominent techniques (spatial K-anonymity, PIR for nearest-neighbor queries)
- Differentially private approaches (private spatial decompositions, trajectory protection)



NN-ASR Approach — Hilbert-ASR Approach

Interested in meeting the PIs? Attach post-it note below!

The 3rd NSF Secure and Trustworthy Cyberspace Principal Investigator Meeting
January 9-11, 2017
Arlington, Virginia

National Science Foundation
WHERE DISCOVERIES BEGIN

UMASS BOSTON