Research: Mobile Phone Emergency Applications
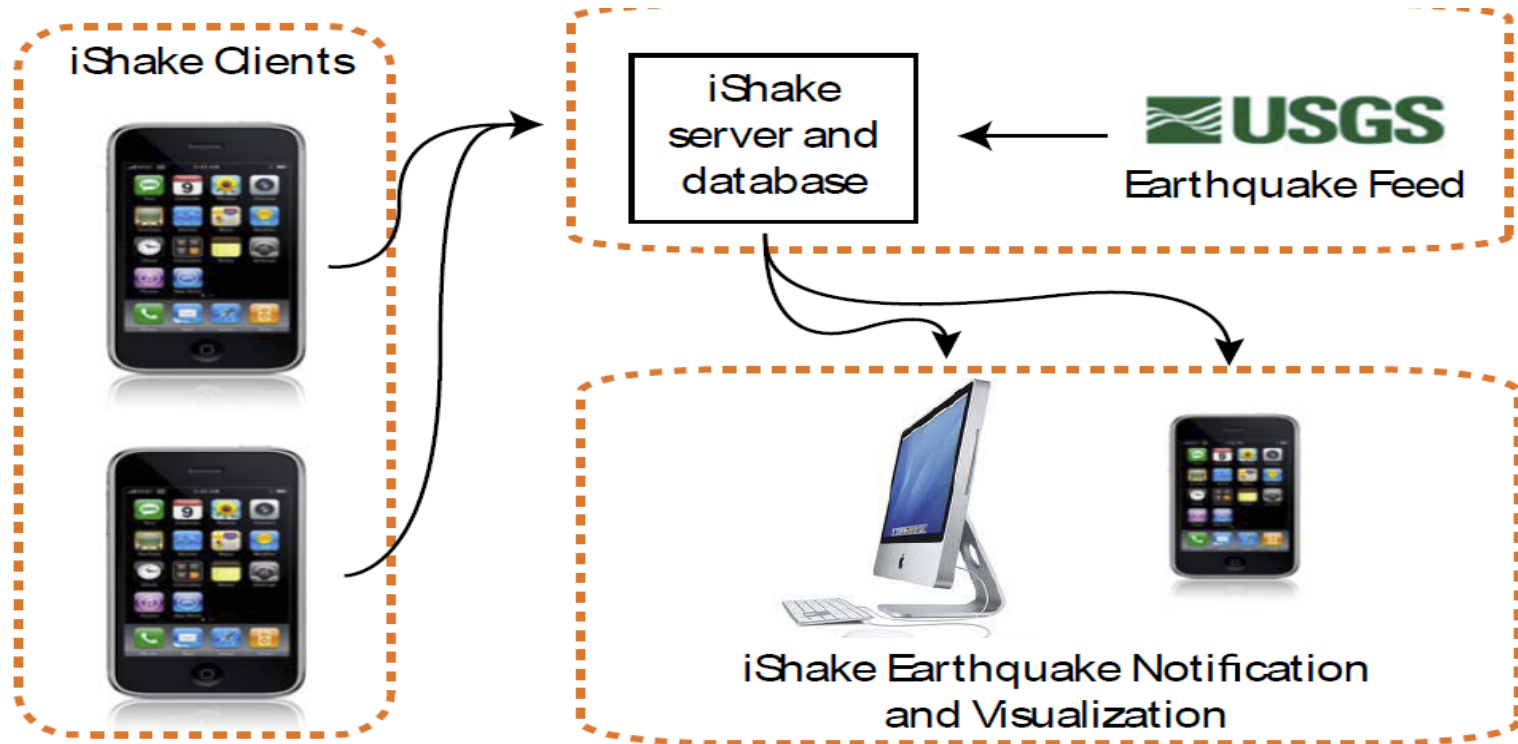
Russell Fritch

Overview

- iShake

- WreckWatch

- SoundSense

- AdHoc Mobile Networks

- Further Research

iShake

- iPhone Application that is used to quickly and accurately map earthquakes.

iShake Client

- **State based detection**
  - Wait For Stillness
  - Passive/Buffer Mode
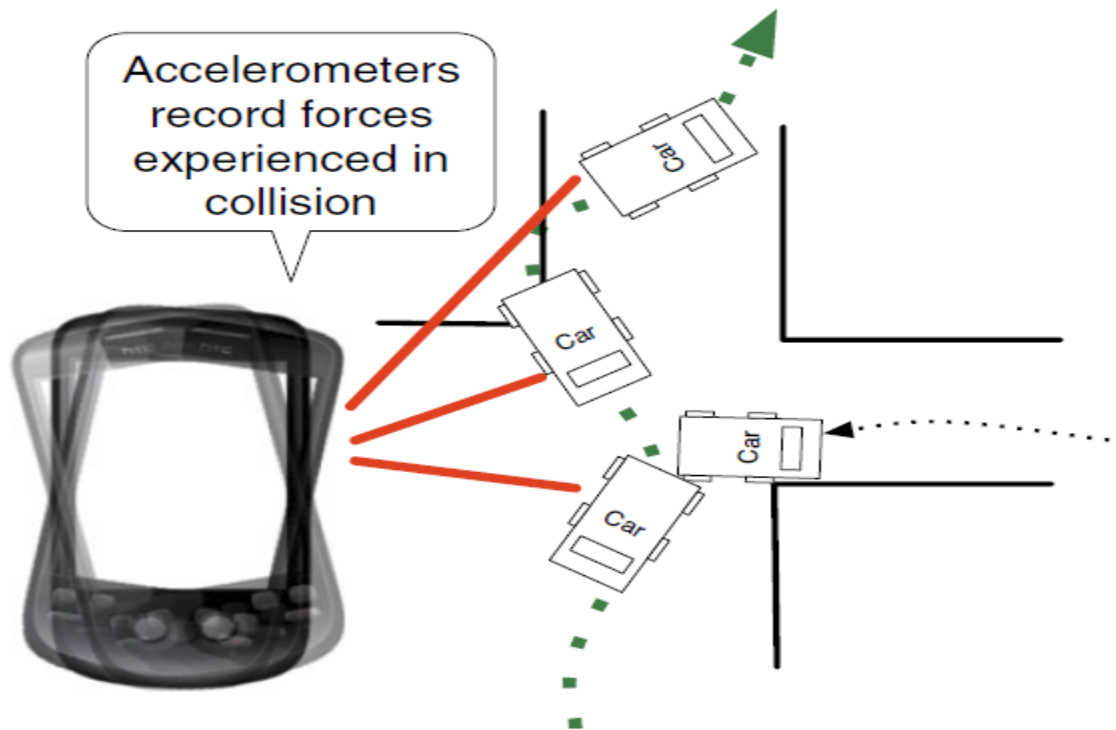 - Streaming Mode

iShake Server

- Filters Data
- Correlates Data
  - Other iPhones
  - USGS

iShake Issues

- Adoption by users
- False Positives
- Relies exclusively on Accelerometer
- Network Outages

WreckWatch

- An Android application that detects high g-forces and loud sounds to notify emergency service about traffic accidents.

WreckWatch

- TheWreckWatch accident detection algorithm operates on an 11 variable formula.

- *(1) a high acceleration event and a high decibel sound event are recorded while the vehicle is moving above the threshold speed*

- *(2) the distance moved since the last time the speed threshold was exceeded is less than M feet and an acceleration and sound event occur.*

WreckWatch
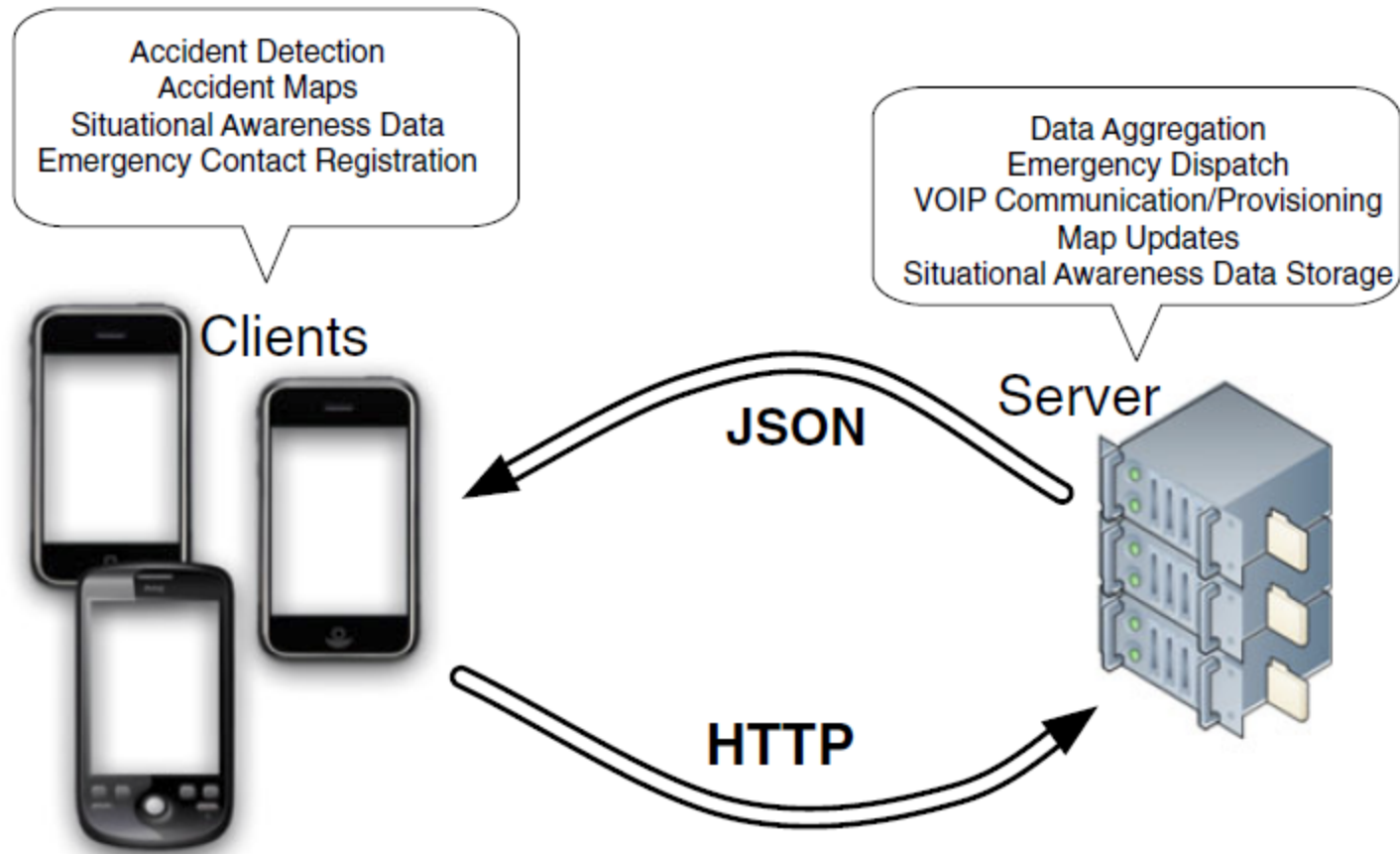
WreckWatch

- Advantages
  - Measure forces on victim of accident
  - Widespread adoption could improve accident detection
  - Easy OTA upgrades
  - Situational Awareness
- Issues
  - False positives
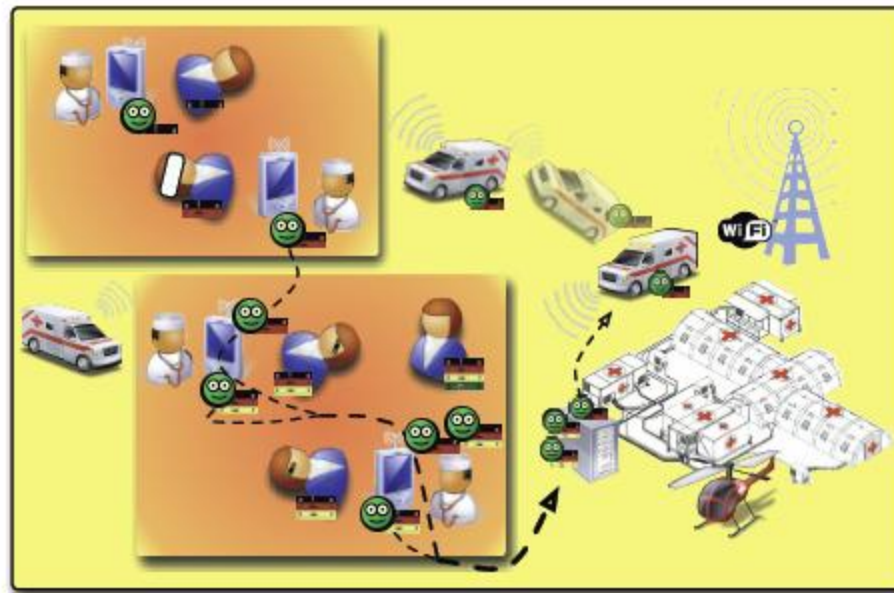 - Misses low speed impacts

SoundSense

- *Sound captured by a mobile phone's microphone is a rich source of information that can be used to make accurate inferences about the person carrying the phone, their environments and social events.*

SoundSense
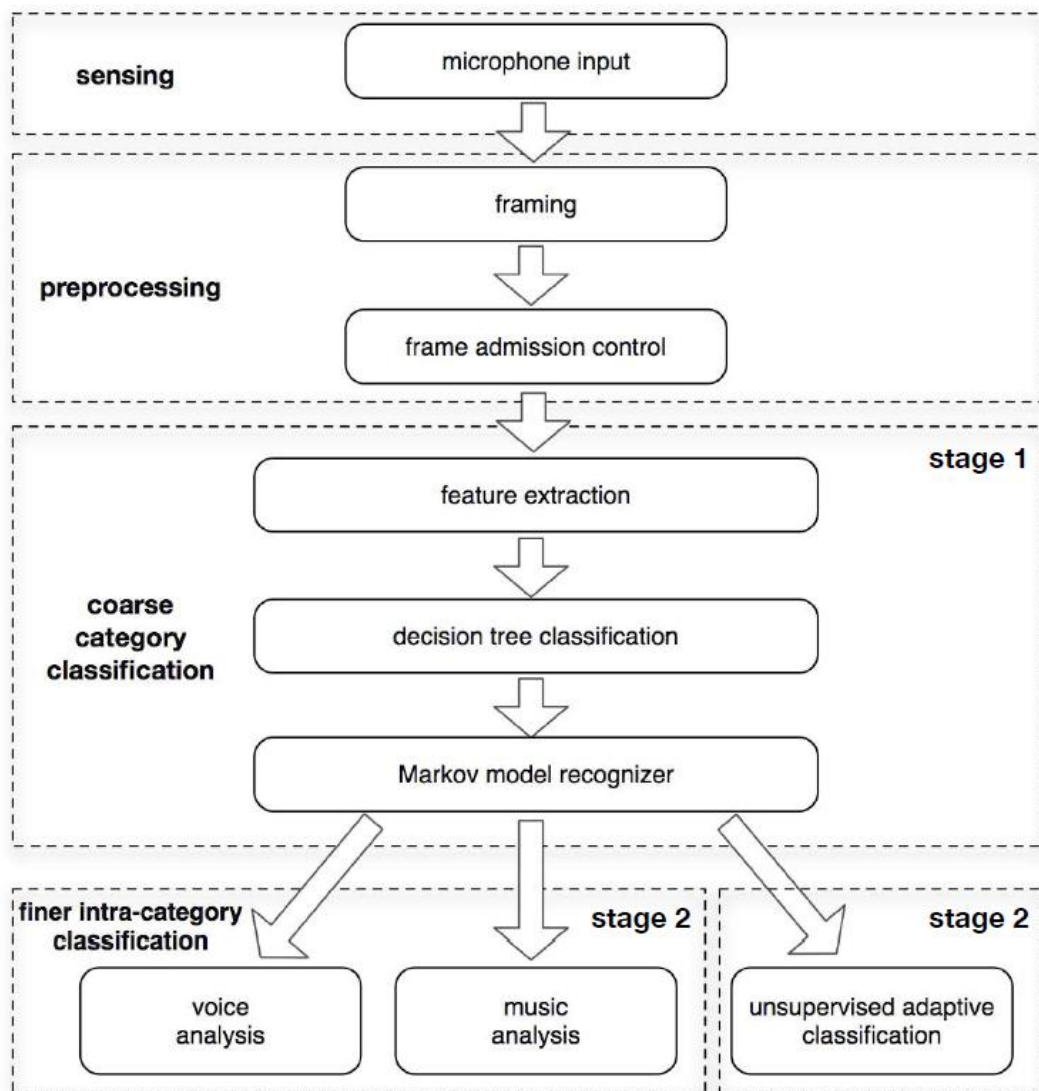
Mobile Agent Electronic Triage Tag

- An mobile agent based ad hoc network used in disaster recovery

- MAETT, TTR

Analysis / Further Research

- Could be improved by prompting nearby phones for data needs. Pictures, videos, sound etc

- Generic mobile emergency agent that replaces the Emergency Alert System (EAS)

- Gives emergency services and victims relevant information to help in a disaster

A Generic Emergency Detection System

- Model Based Agent that uses multiple percepts
  - Accelerometer
  - Microphone
  - Vision
  - Network

Possible scenarios

- Plain, Train, Car, Bus wreck
- Terrorist attack
- Earthquake
- Tornado, Hurricane
- Health issue (heart attack, seizure, etc)
- Alien Invasion

Possible Actions

- Give evacuation instructions
- Camera of injuries or accident to help emergency services
- Accelerometer data of car wreck, earth quake, bomb dropping to help reconstruct event
- Alert emergency services
- Send Sound recording of event to determine scenario
- Perform actions commanded by the server

Questions?

Refrences

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