



Finding People in Natural Disasters

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FIND is a deliverable of ASTARTE project

Task 10.3 aims at: Developing a smartphone application that will encompass four different facets:

- 1) A notification mechanism that provides individuals with tsunami alerts and critical information;
- 2) A navigation component that provides individuals with contextualized guidelines for evacuation;
- 3) A communication module **requiring no infrastructure** to establish contact with other individuals in his/hers surroundings;
- 4) An extended semi-automatic communication mechanism to communicate with search communities, rescue teams and authorities.





FIND

This application is focused in the aftermath of natural disasters, in situations when communication infrastructure fails or is overloaded hindering the dissemination of information



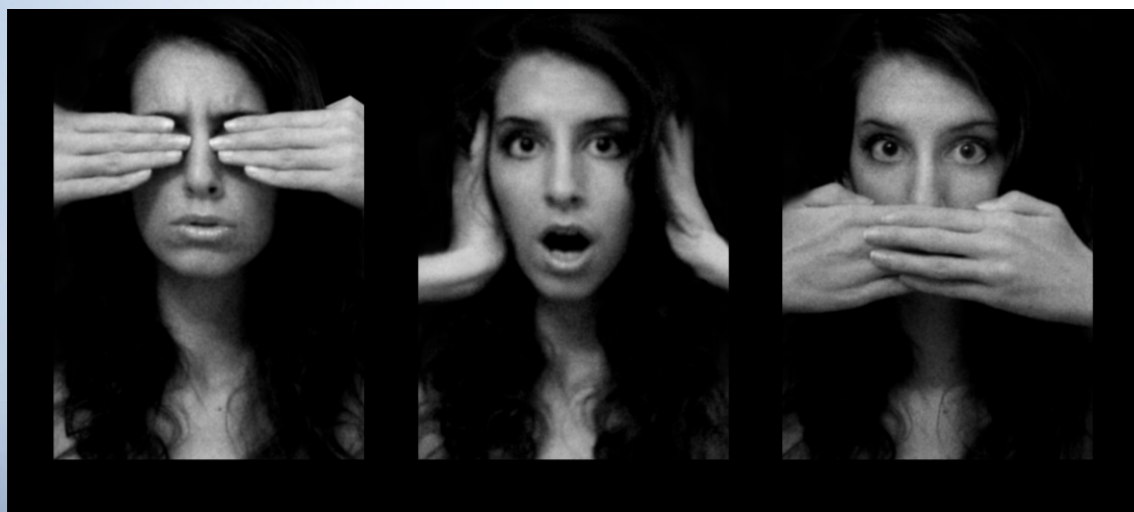


- It uses the fact that when disasters (like earthquakes, hurricanes or tsunamis) hit populated areas, members of the affected communities often offer themselves to help in the field.
- Volunteers may not have the necessary knowledge to provide first aid to victims in every situation, but:
 - They know very well the affected area!
 - **They have a better sense of which people are missing!**
 - And in areas that become isolated, local volunteers are sometimes the primary emergency responders for extended periods of time!





However, at those sites in the immediate aftermath of events, accurate information about the location and status of potential victims is often hard to collect, even for locals.





Moreover, the communication infrastructure fails or is overloaded, hindering the dissemination of information, amongst volunteers, victims and volunteers and volunteers and professional rescuers.



What is needed? An app that turns your phone or tablet into a peer-to-peer communication device.

No need for Internet connection, just neighbor people with ad-hoc-enabled devices of their own.





We propose FIND (Finding Inaccessible people in Natural Disasters), a system that tackles the challenge of providing a source of actionable information to volunteer responders. To operate on commodity devices, it takes advantage of the ability smartphones have to act as Wi-Fi access points

It includes

- An ad-hoc opportunistic network support
- A smartphone application that keeps disseminating aliveness data
- A tablet application that gathers and shows data from neighbour smartphones
- A server that consolidates data from all sources
- A Web application that shows comprehensive data



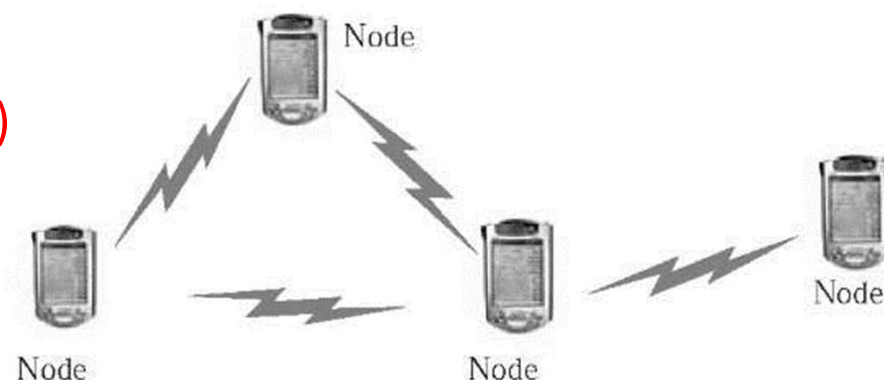


The app is responsible for gathering data from the victims using a non-obstructive approach. It consists of an Android application that activates a set of predefined sensors.

A dynamic mesh is created with the devices in the area, acting as nodes in an opportunistic network. While the application is intended to be activated by a central remote authority, victims can also manually activate it.



- No infrastructured network required: person-to-persons; mobile-to-mobiles (device2device)
- Each smartphone tries to directly connect to neighbours and/or provide connection to others
- Dissemination of data is epidemic. Repeated data is eliminated.





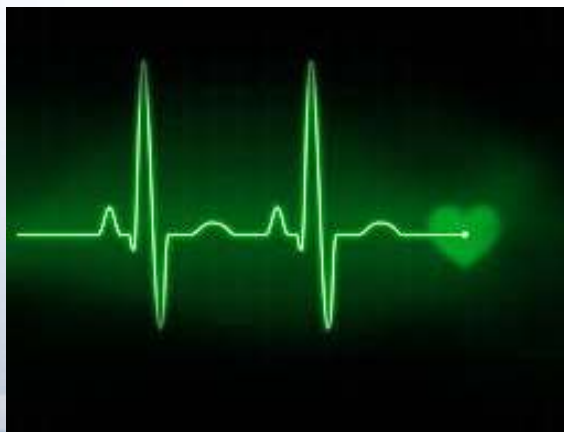
FIND (Finding Inaccessible people in Natural Disasters),

FIND – mobile app

The smartphone application automatically gathers location and aliveness activity information from people's smartphones, which then tries to disseminate in a peer-to-peer, ad-hoc network.

This network requires no infrastructure, relying solely in availability of neighbouring smartphones.

- Involuntary: micro moves (accelerometer), Indirect: displacement- (GPS), integration activity (screen touches)
- ECG or other if sensor available)





FIND (Finding Inaccessible people in Natural Disasters), FIND – mobile app

It is possible for the victims to send text messages. These allow victims to describe their condition or the status of surroundings with free text. Victims can also mark themselves as safe, if they managed to escape from the disaster.



I need help!

Battery is crucial!



It considers minimal
energy consumption



FIND – tablet app



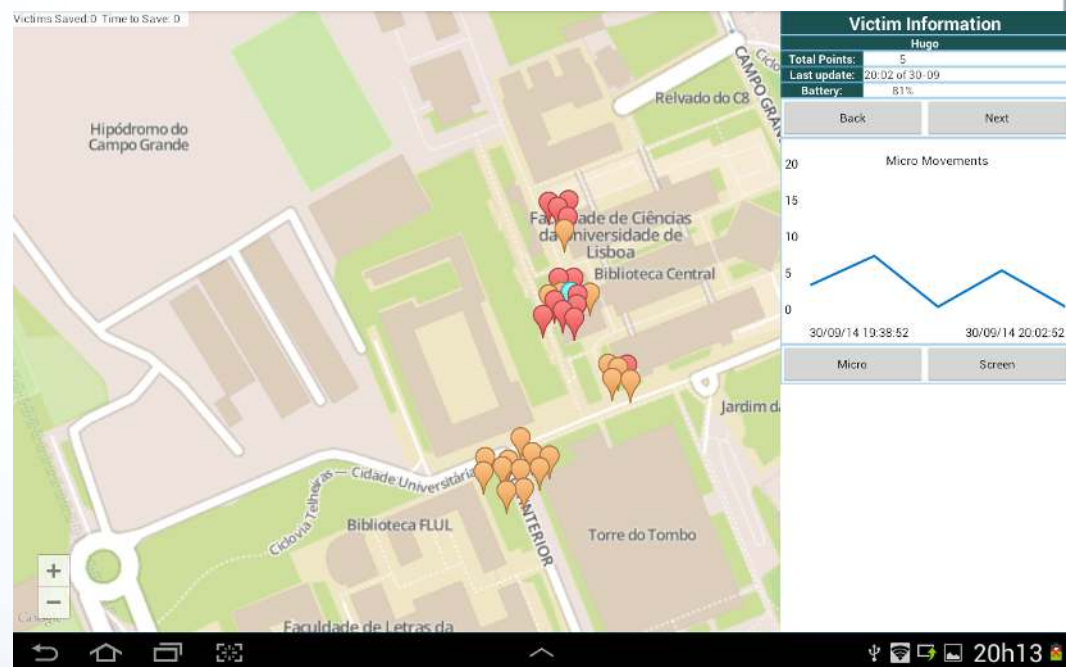
A second component, a **tablet application**, provides a visualization map where volunteers can directly track the data provided by the victims' smartphones.

It shows location and history of the victims' aliveness data thus informing the volunteers about the people's conditions in his/her vicinity.

It uses the same **ad-hot network** but it extends it **by actively searching for any available infrastructured network**.

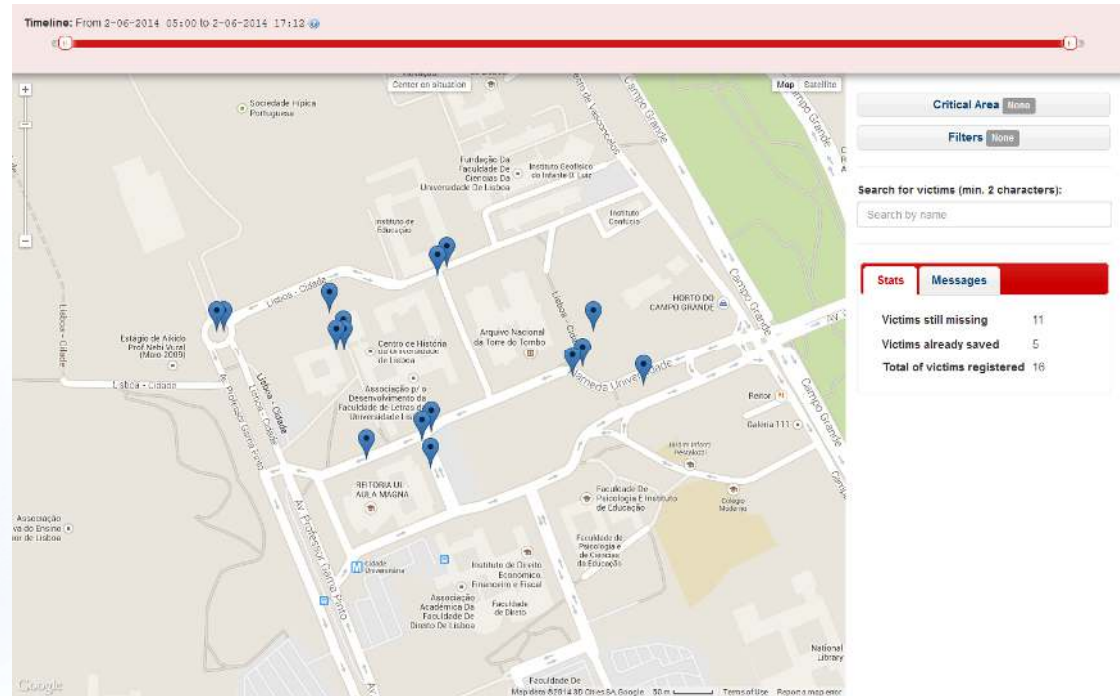
Used by volunteers to:

- Inform rescuers whenever a rescuers' device is accessible
- Inform volunteers for local operations
- Contributes to the dissemination of information





FIND – Web app and server .



The Web app is similar

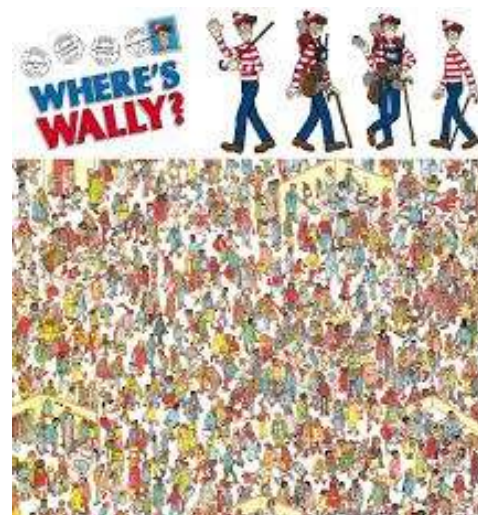
- One can gather the server and the app in one laptop and make it a mobile rescue centre with ad-hoc or access point connection
- Or it can be very much infrastructured: huge server hardware; large DB; full internet connection...

Presentation is similar to the tablet with further:

- Filtering options
- Critical areas annotation



Two studies have been conducted for preliminary validation of the solution. The first assesses the comprehension that users may have of the mapping tool. The second evaluates the efficiency of the tablet tool in rescuing operations, particularly considering the decisions people make when faced with the aliveness data.



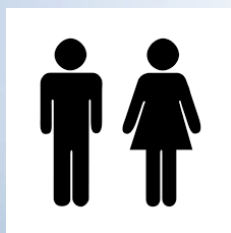
The Web app was tested by users: concepts were understood and interaction mechanism used as expected. Improvements were incorporated.





FIND

smart phone app



tablet app

+

Smart phone app



Available for free
at Google play
(soon...)

Local
Authorities

&





For details refer to www.Astarte-project.eu

Astarte presentation at Conference on Collaboration and Technology (CRIWG 2014) Santiago – Chile

Or contact one of the authors

Thank you!



University of Lisbon

