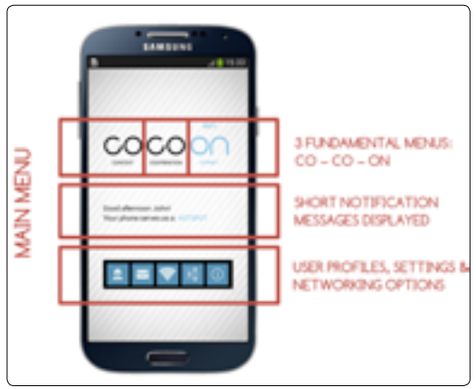
35. Using smartphones for emergency messaging

Even in case that a GSM network is down (like during the Enschede fireworks disaster) or overloaded (like during recent festivals), it is important for public safety that smartphones can still be used for emergency text messaging. In this way the authorities can inform the public about the emergency. We have developed a way to realize this emergency communication.



Our protocol is called COCOON: Context-aware co-operative opportunistic network. COCOON can be used on any phone and is primarily being developed for the emergency festival scenario, to inform the public during big events. Apart from emergency scenarios, COCOON can also be used by normal users in a 'Twitter-style': to send and receive short messages in a peer-to-peer fashion.

ICT science question

How can smartphones still be used for emergency messaging in the case that the GSM-network is down? What protocol do we need for this? How can we optimize its performance and the effectiveness? How do we make the protocol scalable from a small to a large network of smartphones? To solve these problems we use the WiFi (or Bluetooth) radio installed in almost every smartphone. Although this has been tried before, it could only be accomplished in phones that had been hacked in order to change the core software of the phone. Such efforts excluded the general public. Our protocol solves this problem as well.

Application

COCOON can be used on any phone and is being developed to inform the public during emergencies at big events and festivals. The first and foremost partner in our research is the Dutch police. COCOON is under development and is being tested on a small-scale. We have plans to perform medium- to large-scale tests in 2015. At present, the protocol code is stable, but further testing is needed for optimization.

There are some similar products available, but they all have limitations: OLSR (only hacked phones), Bluetooth communication (limited number of participants, needs previous pairing), WiFi Direct (needs previous pairing).

Alternative Application

Our emergency text messaging protocol has many applications besides the emergency scenario, for example: Twitter-style messaging, advertising by shops or stands, public displays, city promotion and public transport.

We plan to make a public programming interface to COCOON, so it can be embedded in other applications as well, for example in apps used by festivals. COCOON can then also be used to give real-time information on any changes in the program, to let festival visitors give feedback and to give festival visitors the possibility to communicate with others in a Twitter-style.

Nice to know

During Pinkpop it sometimes took more than an hour for an sms to reach its destination.

At Pinkpop 2014 neighbors to the festival were asked to open their WiFi access point for visitors of the festival.

COCOON provides communication in emergencies when everything else fails.

The COCOON platform gives your app direct and free communication with other smartphones.

COCOON is a new way to communicate, available for any modern smartphone.

COCOON is an opportunistic delay-tolerant short message communication protocol for smartphones.

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