

## TECHNOLOGY FOR LOCATING INJURED PEOPLE IN AREAS WITHOUT MOBILE PHONE COVERAGE

### DESCRIPTION OF THE TECHNOLOGY

The technology developed by researchers at the University of Alicante allows the use of a smartphone to locate people injured in remote environments where there is no mobile phone coverage (GSM/UMTS). The smartphone emits a Wi-Fi signal that acts as a distress beacon and can reach a distance of several kilometers.

The current technologies for requesting assistance in recreational activities in nature are based on three technologies (mobile phone service, VHF stations and satellite systems), although the most widespread in use is the mobile phone service contacting with the emergency number 112.

In geographical areas where there is no coverage of the mobile phone service, the citizen does not have the possibility to establish any contact to request help with his smartphone.

However, it is possible, with the technology developed, to give any smartphone the ability to generate a distress signal. This signal informs the GNSS (GPS / Glonass / Galileo) location and is detectable several kilometers away.

The technology developed consists of two fundamental elements, the software (App) incorporated in the emitting smartphone and a receiving device designed to receive and interpret the signal.

The smartphone must be equipped with a GNSS receiver and a Wi-Fi interface, elements found in almost all smartphones on the market. In addition, it must have installed an App, specifically designed by the researchers of the University, that emits the distress signal detectable by the receiving device. The developed App can be used by any smartphone that owns the Android operating system. Also, the App could be developed for other operating systems.

The receiving device used by rescue teams or mountain refuges, allows the signal to be detected several kilometers away, depending on the terrain orographic conditions and the physical characteristics of its antenna. The device has a small antenna and it connects to the rescuer's smartphone where the received signals are displayed.

When an incident occurs, the injured person only has to activate the App of the smartphone that will emit the signal periodically indicating the coordinates of his position.

Rescue teams equipped with the portable receiving device will perform their search operations with the advantage that they do not need to have visual contact with the injured person. At the moment they can detect a single signal, that will indicate the exact position of the injured, even if it is several kilometers away.

### MARKET APPLICATION SECTORS

This technology brings added value fundamentally in the following circumstances:

- When there is no mobile phone coverage.
- When the speed in accessing the injured is vital to save his life.
- When there is difficulty in locating the injured because of adverse weather conditions or poor visibility.

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An area of specific application have been detected where this technology would be vital to save lives: high mountain rescue.

This technology is of interest for computer and telecommunications companies operating in the indicated areas (adventure sports, navigation,...), companies that develop equipment in general for mountain sports, equipment for boats, rescue services,...

### TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The main advantages of the technology are:

- Users do not need to purchase a specific device to emit a distress signal. Any smartphone that incorporates the App can emit the signal.
- The receiving devices of rescue teams have a low cost.
- The weight of the receiving devices is also very low. Can be carried in a backpack.
- There is no need of the existence of mobile phone coverage.
- The signal can be emitted for hours or even days. It can be disabled the rest of services on the smartphone and save battery, increasing the duration of the signal.
- The signal can be configured, incorporating relevant data such as the GPS coordinates of the accident, the identification of the person or a small message about the type of accident.
- The signal can be detected from long distances, depending on the orography of the place from which it is emitted. In actual mountain tests the signal was detected about 3 kilometers away.
- Allows an injured to continue transmitting a distress signal even if he has lost consciousness or loses mobile phone contact with the rescue teams.
- In situations of bad weather conditions (blizzard, fog) or night time, it is possible to locate an injured with great precision, without having to make eye contact.

### CURRENT STATE OF DEVELOPMENT

The technology has been tested in high mountain simulating real cases with rescue teams. The tests performed have been very satisfactory, locating the injured in different locations, in a very short time. Those responsible for the rescue teams have been interested in being able to pilot tests in real conditions with hikers.

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### INTELLECTUAL PROPERTY RIGHTS

This technology is protected as intellectual property by registering in the repository of the University of Alicante (RUA), within the registry of computer programs and databases:

- Title of the registry: "SYSTEM FOR BROADCASTING GEOLOCATION INFORMATION IN EMERGENCY SITUATIONS VIA WI-FI INTERFACES OF SMARTPHONES".
- Creation date: 01/09/2016. Publication date: 24/03/2017

### COLABORATION SOUGHT

Companies interested in acquiring this technology for **commercial exploitation** through licensing agreement or technical cooperation agreements are required.

### RELATED IMAGES



**Figure 1:** Smartphone of the injured person



**Figure 2:** Device of the rescue equipment

### CONTACT

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