MyCarMobile: an application for calling travel assistance

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Abstract

Deaf face serious problems when they need to communicate at distance or with non-deaf people. This is especially critical for reporting and describing emergency or hazardous situations to ask for help. Mobile devices offer solutions for these situations, which rely usually in jerky text messages exchange or in expensive video calls to sign language interpreters.

This paper presents MyCarMobile, a mobile application intended to facilitate the communication of deaf with travel assistance services to describe an occurrence, using an alternative communication mechanism based in the interaction with icons and buttons in a touchscreen device.

Author Keywords

Deaf; mobile application; travel assistance.

ACM Classification Keywords

H.5.2. Information interfaces and presentation: User Interfaces: Interaction styles.

Introduction

The International Telecommunications Union (ITU) estimates that by the end of 2011 there were about 6 billion mobile phone subscribers all over the world [1]. Mobile devices are currently used in many of people's

daily activities, along with communicating, also as productivity and leisure tools, enabling users to access the web, check emails and social networks, play games, control their calendars or use GPS navigation.

According to the World Report on Disability 2011 [2], the number of disabled people in the world is presently estimated in one billion of which 124.2 million have hearing loss. Mobile phones still present limitations for the communication of deaf with other people, because they cannot use voice calls. This is critical in emergency situations or when they need to ask for help to fix some other problem.

Touchscreens allow interaction with icons and buttons for executing applications or selecting information. This can be explored for non-verbal communication, enabling deaf to communicate without the need for sign language translation and with a richer context than just using text. [1]

This paper presents MyCarMobile, a mobile application that allows users to communicate with travel assistance services (TAS) in case of accident or car malfunction, using iconographic interaction in smartphones.

The remaining of this paper proceeds exploring some background concepts. Then it presents the results of a survey that was conducted to inform the development of the application, which is also generally described. Finally, some concluding remarks are presented.

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1 Patent Pending nr 20121000054228: "Automatic asynchronous mediation of nonverbal communication for interactive iconographic streams".

Related Work

In their daily activities deaf usually rely on sign language, lip reading and text to communicate with other people. For telecommunicating, deaf are not able to use audio and thus rely on text messages [3, 4, 5] and video calls with sign language [6, 7, 8, 9, 10]. However, these two approaches have some flaws: text communication is slow and intermittent, requiring several interactions that can annoy conversation; on the other hand, sign language is a skill possessed by a few people other than deaf and for telecommunicating it requires a video connection, which is an expensive resource and often unavailable while travelling.

An approach to overcome the communication ineffectiveness of text and video in mobile devices is the aforementioned use of interactive icons and buttons in smartphones with touchscreen, a solution that was previously proposed for contacting emergency services [11].

MyCarMobile prototype

The MyCarMobile application uses interactive graphical information such as icons, diagrams and buttons to allow users to describe problems with the car and report it to a travel assistance service.

The implementation of the prototype was preceded by a survey presented to members of a deaf association, to help identifying the problems faced by deaf drivers in hazardous situations on the road. The survey was responded by 25 deaf, 14 males and 11 females, and aging from 20 to 55 years old. 80% of the respondents were car drivers, of which 55% have needed to contact TAS. The solution to do it was very similar in most situations, with 55% choosing to send an SMS to a

friend or relative, and 30% appealing to another passing driver. Only 5% of the respondents have chosen to make a mobile video call to a sign language interpreter. 56% of the respondents said they had problems communicating with the TAS and 40% were not able to get assistance at all, ending up solving the problem by their own, while 36% resorted on relatives, friends or strangers. Notice that only 32% of the TAS had support for non-verbal communication.

These results confirmed the relevance of the application and the existing perception of the problem, encouraging the development of the alternative solution preconized for MyCarMobile.

Figure 1 shows several interfaces (only in Portuguese, by now) of the MyCarMobile application.

The leftmost interface is the first screen, where the user can select one of 3 buttons corresponding to 3 basic situations: malfunction ("Avaria"), accident ("Acidente") and other situations ("Outras Situações"). If the first option is selected, the interface changes to the second one, which allows to specify the location of the malfunction: engine ("motor"), doors ("Portas"), inside view ("Vista interior") and wheels ("Rodas"). The third interface shows the inside view, and the fourth is the one for the case of accident, enabling to specify the damaged areas. The fifth and sixth interfaces show refinements in the description of the problem, such as reporting broken glasses, requesting hauling or sending GPS coordinates. When the description is complete, an SMS is sent to the TAS (TAS). To help in collecting further information that might be needed, the application has a live chat functionality that keeps the user and the travel assistance service connected with each other.
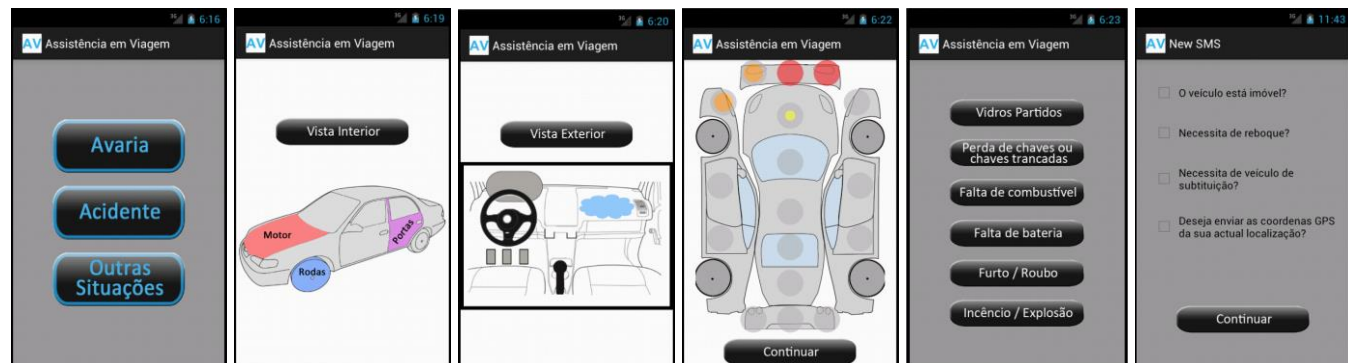

Figure 1. Some interfaces of the MyCarMobile prototype.

Final Remarks

This paper presented a mobile application (MyCarMobile) that allows deaf to contact TAS to report car malfunctions and thus request for help in solving the problem. Despite the initial purpose for deaf, the application has potential to be useful for any driver, due to the embedded flow that helps to describe more accurately the problem to be reported.

A survey was conducted with deaf to help in the specification process, and confirmed the relevance of the application. The prototype that was implemented used interaction with icons and buttons to describe the situation to be reported. Thorough tests of the application by users and travel assistance companies are required, which will provide important feedback for improvements. The integration of clinical and security information will also be considered, expanding the type of assistance that can be provided in case of accident.

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