

A Demonstration of PhotoTacs - A Simple Image-based Phone Dialing Interface for People with Cognitive or Visual Impairments

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ABSTRACT

Modern cell phones are becoming increasingly complex, as more and more features are added to every new generation. These complex user interfaces can make even placing a call difficult for those with disabilities. This presentation demonstrates a fully-functional version of PhotoTacs, an easy-to-use image-based phone book, designed specifically for those with cognitive disabilities and visual impairments.

Categories and Subject Descriptors

K.4.2 [Computers and Society]: Social Issues - *Assistive technologies for persons with disabilities*

C.5.3 [Computer System Implementation]: Microcomputers - *Portable devices (e.g., laptops, personal digital assistants)*

General Terms: Design, Human Factors

Keywords: Assistive technology, cell phone, phone book, cognitive disabilities, illiteracy, visual impairment

1. INTRODUCTION

Cell phones have become increasingly complex since their introduction in 1973. In an effort to gain an advantage in an increasingly competitive market, suppliers have added new features with each new generation of cell phone. However, these additional features have not been welcomed by all users. Users with cognitive or visual impairments can easily become frustrated, as they try to accomplish a seemingly simple task, such as dialing a friend, due to the increased complexity and the decrease in text size to fit on a small screen. This has motivated assistive technology researchers to explore the development of simplified alternatives.

One such technology is the “Cognitive Disabilities” phone proposed by Vanderheiden [2005]. Depending on how it is configured, this phone either dials one pre-set person upon opening the flip phone, or it presents images of four faces on its touch screen, dialing the person whose image is touched by the user. While simple, this phone is limited in the number of contacts that can be stored. GreatCall, Inc. recently released the

Jitterbug [2008] line of cell phones, which is aimed primarily at senior citizens. It features large, backlit buttons, a display with a large font, and a simple user interface that guides the user with yes/no questions. Pressing 0 calls a human operator, who can help the user with directory assistance, or can edit of the phone's internal phone book, based on verbal directions from the user. However, Jitterbug phones are still text-based, and their displays are small compared to modern “smart” phones.

PhotoTacs is an image-based software application that is designed to run on existing smart phones and use their touch-based interface. It allows a person with a cognitive or visual disability to easily select a person from the internal phone book, and then dial them. PhotoTacs makes full use of the large, touch screen displays and the built-in cameras of modern smart phones, allowing it to provide an intuitive and nearly text-free interface.

2. HARDWARE AND SOFTWARE

PhotoTacs is written in the Microsoft C# .NET Mobile 2.0 language and – due to its modest processing requirements – can be made to run on any smart phone running Microsoft Windows Mobile 5.0 or later. This includes a large variety of phones released since 2004. **Figure 1** shows PhotoTacs running on the T-Mobile MDA smart cell phone.

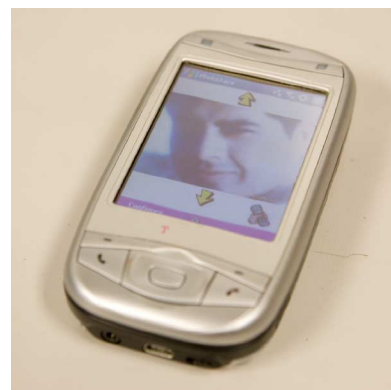


Figure 1. PhotoTacs running on a T-Mobile MDA smart cell phone

Launching the PhotoTacs application is simple. The user simply selects PhotoTacs on the phone's Programs menu, as shown in Figure 2.

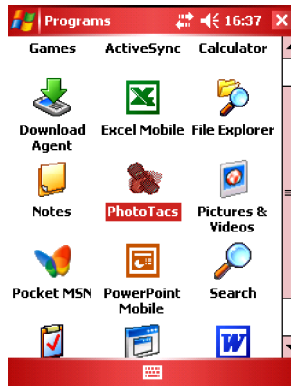


Figure 2. The Programs menu with PhotoTacs highlighted

The PhotoTacs user interface consists of two screens. The primary interface (seen in Figure 3) is the dialer screen. This simple interface allows a user to scroll through the images of contacts by tapping the up and down arrows on the touch screen. The user then places a call by tapping either on the handset icon or on the image of the selected person.

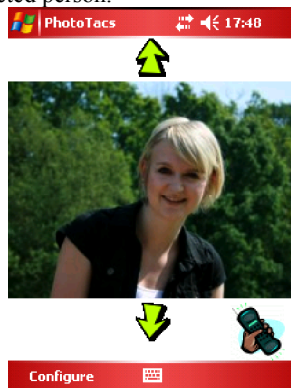


Figure 3. The PhotoTacs dialer screen

The other screen is the configuration screen, as seen in Figure 4, which allows the user to add, remove, or edit the contacts in the phone book. Typically the user simply takes a picture of a person, and then enters their phone number. As an alternative, the user could use a photo already stored on the phone.



Figure 4. The PhotoTacs configuration screen

Table 1 shows each of the icons on the configuration screen and describes its function.

Table 1. The controls of the configuration screen

Photograph-manipulation buttons	
	Take a new photograph
	Select an existing photo
	Remove this image from this contact
	Delete image from phone
Contact-manipulation buttons	
	Previous contact
	Next contact
	Create new contact
	Delete current contact
Other operations	
	Exit the application
	Return to <i>Dialer</i> screen
	Enable the on-screen keyboard. Useful for entering phone numbers.
Phone number entry field	
#	+15557893401

3. THE PRESENTATION

The demonstration is done using an actual cell phone (a T-Mobile MDA smart phone with a touch-sensitive display) with a fully-functional version of PhotoTacs running on it. The audience is shown how to choose a person from the phone book and then dial their number by simply tapping the screen, and how to take a photo of a new person (using the cell phone camera) and add them to the phone book (which takes only a few seconds). Interested persons will be encouraged to try using the features of the phone, and to provide feedback on what they do (or do not) like about the PhotoTacs interface.

4. CONCLUSION

While the features of PhotoTacs can be described, the application software needs to be demonstrated and used to fully appreciate the simplicity and readability of the interface - especially by those with visual or cognitive impairments. In addition, PhotoTacs is an ongoing project, and a demonstration provides opportunities for feedback from potential users and developers of assistive technologies.

5. References

GreatCall Inc, *Jitterbug – A cell phone for Baby Boomers and their parent*, <http://www.jitterbug.com/>, 2008

“T-Mobile® MDA”, HTC.

<http://www.america.htc.com/products/mda/default.html>

Vanderheiden, Gregg, “Person to Person Emergency Communication Technologies, Issues, and Options”. http://tap.gallaudet.edu/Emergency/Nov05Conference/Presentations/vanderheiden_files/800x600/index.html