Amigo – Wireless Image Based Instant Messaging for Handheld Computers

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ABSTRACT
We introduce Amigo – an Instant Messaging (IM) client for handheld computers. Amigo allows free-form images as well as handwriting to be sent between people, taking advantage of the touch sensitive display of mobile devices. Amigo differs from other IM clients in that the text written by the user never has to be translated into ASCII data. Twenty students used Amigo for two weeks. Preliminary use results show that Amigo functions well as an IM client for handheld computers, and also introduces new ways for people to interact using IM: mixed text/image sessions, collaborative drawings and instant gaming.

Keywords
Instant Messaging, handheld computing, pen-based user interface, uninterpreted handwriting.

INTRODUCTION
Recent years there has been a growing interest in the area of Instant Messaging (IM) [1, 5]. The emerging mobile market has resulted in IM software recently becoming available for mobile devices such as handheld computers and mobile phones. However, entering text on a handheld computer can be difficult, since current input methods are both slow and error prone. This is a recognized problem and much research has been conducted in the field [4]. The input options for text entry on most handheld computers today are virtual keyboards or the use of handwritten text that is interpretable by a character recognizer. Since IM is human-to-human communication and the IM client only is the transferring medium, the computer need not interpret the text in the messages. When adapting IM to mobile devices with a pen-based interface it is possible to use uninterpreted handwriting as input option, since it is not necessary to translate the input into text.

To simplify the use of IM on mobile devices we have created Amigo. Amigo is an IM client that addresses the input problem on handheld computers and takes advantage of the possibility to use uninterpreted handwriting. Amigo makes it possible to send handwritten text and color drawings as instant messages to other users. Compared to other mobile IM clients such as [2, 6] that focus on awareness, our focus with Amigo has been to provide new input options for Instant Messaging on mobile devices.

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INTERFACES AND USE
Amigo comprises two modes of operation – awareness and messaging. The awareness interface contains a contact list that shows the users currently online on Amigo, and is used to initiate new sessions. The messaging interface (see Figure 1) contains the drawing area, incoming message area, smiley archive, drawing tools and history archive. This mode also contains a list of the user's current chat partners, making it possible to switch between active sessions.

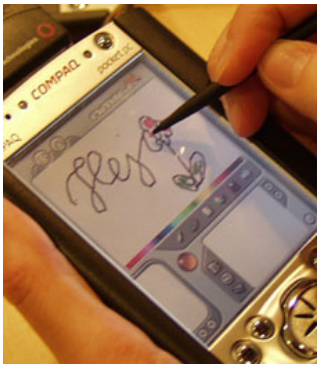


Figure 1: Amigo on an Ipaq H3630

IMPLEMENTATION
Amigo was implemented on Compaq IPAQ H3630 Pocket PCs equipped with a Wireless LAN network expansion module. Amigo uses a network communication protocol similar to ICQ [3], where awareness and messaging data are sent as UDP network packets between devices. Awareness information is sent periodically from each device to a central server, which in turn notifies devices connected to it when changes occur. Image based messages sent between devices are encoded as true-color, loss less PNG images before sending. Amigo is written in C++ and has been implemented on both handheld computers and PCs for test and development.

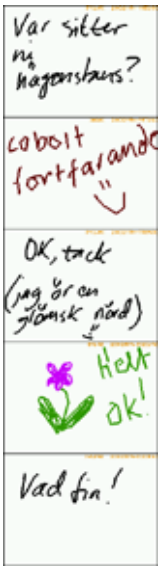
USAGE STUDY
We conducted a study at a local university, where 20 students used Amigo for two weeks. Each student was equipped with a Wireless LAN enabled handheld computer before the study started. After installing the Amigo software, a brief workshop was given with the purpose of demonstrating the Amigo interface. After the workshop the students were encouraged to try out and use Amigo at their own discretion. Log files were collected regularly from the

handheld computers. During these two weeks we collected log files from 138 conversations, consisting of 1243 messages. At the end of the test period we conducted a workshop to discuss different aspects of Amigo with the students.

PRELIMINARY USE RESULTS

The study shows that uninterpreted handwriting is a suitable input method for Instant Messaging on mobile devices. We found that Amigo was not only working well for regular IM conversation, i.e. sending text messages, but that the users also frequently used the possibility to draw colorful free-formed images and combine them with text to express themselves. Amigo was used for new forms of communication not possible with other mobile IM applications:

1. Mixed text/image sessions - many text sessions were augmented by inserting an image in the communicative flow (see Figure 2, 3). Figure 2 shows how a flower is used to personalize the message. Figure 3 shows how two users switch between using text and images, deciding on a wine date.



User 1: Where are you?

User 2: "cobolt" still

User 1: OK. Thanks. (I'm a forgetful nerd)

User 2: That's OK!

User 1: How pretty!

Figure 2

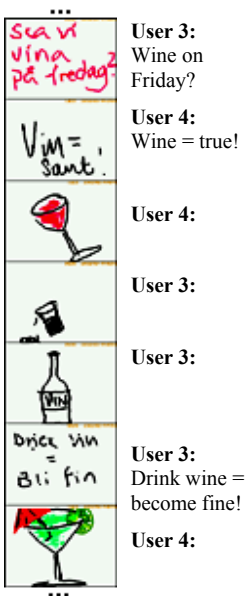
2. Collaborative drawing - several students used Amigo to draw collaboratively on a picture, (see Figure 4) sending the picture between each other altering it between every turn.

3. Instant gaming – the students used the drawing canvas to play games. Figure 5 shows a part of the log from two users playing tick-tack-toe.

During the workshop the students were positive to the way they could express themselves in the free form that image based instant messaging allows. Many students noted that handwriting and colorful images gave their messages a very personal touch, and made it possible to convey emotions in a way not possible with other IM clients. In general the students found Amigo useful, functional and also a lot of fun.

CONCLUSION AND FUTURE WORK

The main contribution of Amigo is its support for image based instant messaging for handheld computers. Initially designed as an easy way to send instant messages between mobile devices, the use of Amigo have highlighted three new communication forms not possible with other mobile IM software: mixed text/image sessions, collaborative drawings and instant gaming. The findings indicate that uninterpreted handwriting is not only a suitable method for



User 3: Wine on Friday?

User 4: Wine = true!

User 4:

User 3:

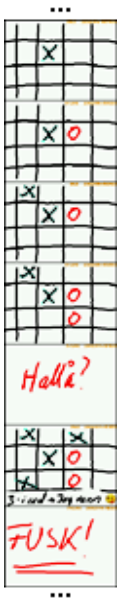
User 3:

User 3: Drink wine = become fine!

User 4:

Figure 3

Figure 4



User 5:

User 6:

User 5:

User 6:

User 6: Hello?

User 5:

User 6: Cheating!

Figure 5

text input on mobile IM clients, but also expands the possibility of expression for the user. Future work involves a long-term evaluation study of Amigo in use. Our homogenous user group and the chosen environment may have affected our current results, thus we also plan to expand our study to include non-students in different environments.

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