PhotoRouter: Destination-Centric Mobile Media Messaging (Demonstration Description)

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PhotoRouter: Destination-Centric Mobile Media Messaging

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ABSTRACT

The number of people using cameraphones is growing by tens of millions every month. Yet the majority of cameraphone users have difficulty transferring photos off their phone and sharing them with others. *PhotoRouter* is a software application for cameraphones that makes the photo sharing process destination-centric by allowing users to focus on *who* the photo should go to, not *how* it needs to get there. Attempting to produce an application which meets user needs better than current, technology-centric cameraphone photo sharing applications, we designed PhotoRouter. In this paper we describe PhotoRouter's user interface innovations that we will show in our technical demonstration.

Categories and Subject Descriptors

H5.1. [**Information interfaces and presentation (e.g., HCI)**]: Multimedia Information Systems; H.4.3. [**Information systems and applications]:** Communications Applications.

General Terms

Design, Human Factors.

Keywords

Cameraphones, photo sharing, social software, destination-centric routing, mobile user interface design.

1. INTRODUCTION

The adoption of cameraphones has taken off extraordinarily quickly in the last few years. In 2004 alone, 257 million cameraphones were shipped worldwide. InfoTrends/CAP Ventures predicts that 860 million cameraphones will be shipped in 2009, accounting for 89% of all mobile phone handsets. While cameraphone hardware—resolution, storage, bandwidth, etc.—has steadily improved, software for mobile photo management and messaging remains cumbersome. Users have to navigate through numerous menus which provide poor mapping between intention, action, and outcome. PhotoRouter aims to remove these obtuse interactions by redesigning mobile photoware from the ground up. The PhotoRouter prototype application introduces a unified media messaging paradigm driven by hotkey shortcuts and a destination-centric usage model.

In theory, many cameraphones allow for instant photo sharing via the multimedia messaging service (MMS). However, photos are inherently different from text messages in that their recipients are not predetermined. Whereas a text message is composed for an intended recipient, multimedia content usually is not. Multimedia content is often shared with multiple recipients and shared multiple times after the time of capture. Moreover, multimedia content can be sent through many transport protocols such as MMS, HTTP, email, or Bluetooth. PhotoRouter incorporates these insights into the application design.

The design of PhotoRouter is destination-centric, meaning the system masks the underlying transport protocols and thereby lightens the user's mental load. Instead of having to decide to send a photo by email, MMS, HTTP, or Bluetooth, PhotoRouter stores each recipient's preference of how *they* would like to receive photos. For example, a single PhotoRouter sharing action could enable a baby photo to be sent to Uncle Bob's email, Mom's phone via MMS, and Grandma's home via snail mail. Because PhotoRouter tracks the routing preferences of its users, all the sender has to do is push one button to select the recipient without worrying about the delivery method.

2. SYSTEM DESCRIPTION

The PhotoRouter system consists of a client application running on the user's cameraphone and a server application running on a web application server. We built the client application using Java 2 Mobile Edition (J2ME), and the server application following the Java 2 Enterprise Edition (J2EE) specification. The J2ME client application can in theory run on any cameraphone handset that is J2ME compliant. However, we only tested it on the Nokia 7610 phone that we had available for our study. We ran the server application on a commercial Web application server, Resin. The server application can in theory run on any J2EE compliant Web application server.

The client application is the primary way the user interacts with the PhotoRouter system. The client allows users to *view* photos that other users have shared with them, capture new photos, tag, rate, and set access permissions for photos, and share photos with other users. The user may also view incoming automatic share requests, and view and manage currently active automatic shares. The server application has two primary functions: to act as the router of shared photos between users, and as a Web application that serves as an online photo album for PhotoRouter users and a profile manager.

3. APPLICATION DESIGN

Current photo sharing processes require the user to think about *how*—namely, which technological mechanisms and transport protocols need to be used—to get photos to recipients. PhotoRouter is designed to be destination-centric rather than

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technology-centric, focusing on the tasks users want to accomplish and hiding the technical details of how those tasks are accomplished. Users are currently compelled to use a wide variety of existing services and applications to get photos from mobile devices to other mobile users, personal computers, or network photo services. Currently users must use different applications and procedures to email, MMS, blog, or otherwise distribute photos.

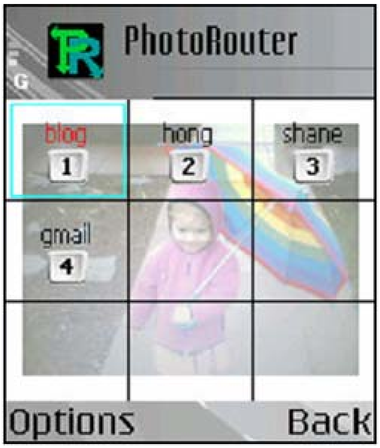
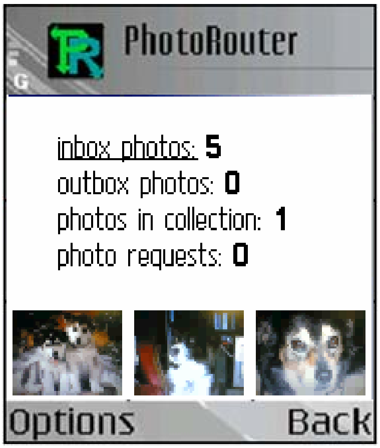


Figure 1. PhotoRouter's "speed-dial" for photo sharing.

PhotoRouter provides a simple unified interface to the variety of methods for sharing, organizing, publishing, and archiving photos captured with cameraphones. PhotoRouter further streamlines the photo sharing process by providing a consistent user interface that abstracts away the underlying transport prototcols, making all destinations appear the same to the sending user. The idea of destination-centric routing is central to PhotoRouter. PhotoRouter displays all potential photo recipients and destinations—blogs, email addresses, and other PhotoRouter users—the same way in the user interface and allows users to share photos to any destinations via the same methods. When a user chooses to share a photo, they select the recipient's alias via the contact grid (See Figure 1) and don't need to think about how the photo will get to that recipient. The photo is sent to the PhotoRouter server along with the recipient information, and the server handles the destination-specific details of sending out emails, posting to a blog, forwarding the photo to another user's phone, etc. Users manage recipient profiles via a web interface, and the server uses this profile information to route photos via the appropriate method.

Since all recipients (regardless of the method used to deliver the photo) appear together in the handset user interface, the PhotoRouter sharing process is very simple. After capturing a photo or selecting a photo from the collection of all stored photos, the user simply selects one or more recipients and optionally adds a message to the photo. To further streamline the sharing process, PhotoRouter uses a speed-dial metaphor for sharing. A user's most frequent share recipients are mapped to the keys on the handset's numeric keypad. A grid displaying the digits 1-9 and their associated recipients can be called up and displayed superimposed over the photo by pressing the keypad's '#' key. From the contact grid a user can select one or more recipients with the keypad or with the phone's joystick.

The '#' key is an example of one of many hotkey shortcuts provided by PhotoRouter. Since all phone handsets have similar keypads, containing at least the digits 0-9 and the '*' and '#' characters, it makes sense to associate some functionality with these keys. While all functionality can be accessed through standard menus, PhotoRouter also uses the phone's keypad to access frequently used functions.



inbox photos: 5
outbox photos: 0
photos in collection: 1
photo requests: 0

Figure 2. PhotoRouter's "Photo Ticker".

Another design feature is a scrolling ticker of photos currently on the handset (See Figure 2). Photos are grouped into three collections: Inbox, Outbox, and My Photos. Moving the joystick up and down allows a user to select which collection is displayed in the photo ticker on PhotoRouter's main screen. Joystick left/right allows the user to select photos within the ticker. The ticker also allows users to receive photos with little fanfare and without interrupting their current actions. New photos just appear in chronological sequence in the Inbox ticker accompanied by an optional audio alert. Finally, the photo ticker allows all photos (those taken by the user and those shared to the user) to be browsed in a similar fashion. With our unified application and user interface for photo sharing, PhotoRouter offers a far simpler solution than the separate applications for browsing, capturing, and receiving photos on most cameraphones.

4. REFERENCES

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