

DataJockey: A Proposed Interface for Data Exchange Using the Lazy Susan Metaphor

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ABSTRACT

In this paper, we propose a novel user interface for interpersonal data exchange between mobile devices. The diversity of mobile devices makes the exchange of data difficult. We simplify the data exchange task by providing a virtual “lazy Susan” — a round turn table used in Chinese restaurants and kitchens—to share the data. Users can put data on the virtual table, and immediately share that data through multiple devices simply by turning a jog dial. The technique might also be used in future for games that involve sharing information between the mobile devices of the players. A prototype system called DataJockey (Fig. 1) has been developed on a PDA and is described in this paper.

KEYWORDS: mobile, data exchange, turn table, jog dial, multi user, multi computer, CSCW, ubiquitous computing.

INTRODUCTION

Mobile information devices are widely used to support interpersonal communication. With today’s connected devices users are able to send data to other recipients by using transfer services like e-mail or wireless connections (e.g., infra-red or Bluetooth). However, if a system is used in a mobile environment with face-to-face communication, the main goal of the system should be to support people communication with each other.

THE DESIGN CONCEPT

Current data transfer techniques such as IR (infra-red) connection or attached e-mail are designed mainly for one-to-one information sharing. The DataJockey interface is designed to make it easy to share data between multiple users, by creating a virtual shared space. Users can then recognize and move data by orienting their devices in the direction of intended recipients.

The “lazy Susan” metaphor also has a playful interface, making communication more enjoyable, which may

increase the amount of communication (data exchange) that occurs.

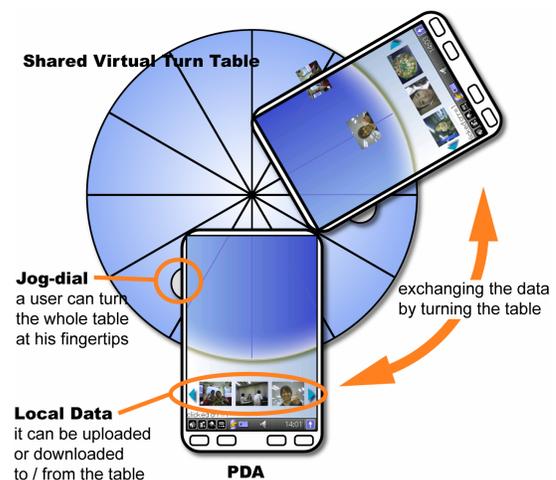


Figure 1: The concept of DataJockey

Devices virtually unified as a single table

The function of the virtual table is described in Figure 1. Adjoining devices are permitted to connect to the same table through a server PC. As a result, multiple devices work as a virtual large space that users share. When one user turns the table in his/her device, the table in the other users’ devices will move simultaneously. In this way the data on the virtual table is moved from one device to another.

Coordination of the real world and the virtual space

Using an address (e.g., an email address) to specify the recipient is an effective technique when users are in a distance to each other. However if users are close to each other, it is not natural to specify network address for each recipient when one can locate the others in physical space. In our technique, the recipient of the data can be indicated more naturally using the direction, not the address.

SAMPLE APPLICATIONS OF DATAJOCKEY

DataJockey can be used in many daily tasks. Here we will describe some examples.

- A digital album facilitates the task of picture-sharing.
- Messaging application for small groups such as classroom or office can be developed.
- DataJockey can be used to support both formal and informal meeting. This should reduce the need for printed materials and meeting handouts.

PROTOTYPE SYSTEM

To prove the usefulness of the proposed interface, we developed a prototype system for sharing digital photos. The prototype system consisted of up to 3 PDA's (SONY CLIE) as clients, and one server using Linux OS.

The photo appearing at the bottom of the screen represents the space for the local data at the user's device. When a user launches the application and connects it to the table server. The virtual table is displayed in the upper-half of the screen. Users can touch the picture at the local space and move it with their finger to the virtual table. In the same way a picture at the virtual table can be moved to the local space. Currently a total of 12 images can be placed on the table.

PRELIMINARY USER STUDY

A workshop using DataJockey as a photo album application was held at our campus in July 2004 (Fig. 2). There were 8 subjects, age 17~19, all female. Subjects were split into 6 groups, and 3 groups used the system at a time. Each group of subjects was asked to take 3~4 pictures using the built-in digital camera of the PDA. After that, they were connected through the virtual table, exchanged the pictures and talked about them for a few minutes.



Figure.2: Recipients using DataJockey

Results

All the subjects easily understood the concept of the design. They started sharing pictures quickly, and talked about the pictures they took. Negotiations about rotation of the virtual table occurred naturally and without dispute or disagreement. The subjects were strangers to each other, but they conversed easily with the help of DataJockey. Few usability problems were observed, although one subject

found it inconvenient that she couldn't check whether the data has been to the recipient until she looked at the recipient's screen. Another subject suggested that she wanted to be able to exchange photos in this way with people in different locations.

DISCUSSION

For data exchange in ubiquitous environments, techniques such as Pick & Drop[1] are proposed. The UbiTable[2] also implements the "lazy Susan" metaphor on stand-alone devices. In contrast, with DataJockey, multiple devices are connected as a virtual table, to make users feel that they're sharing the same information environment without needing a specific infrastructure.

In order to identify participants by pointing, the physical position of the users, and their position in the virtual table must be matched. We are investigating the use of direction sensors for this purpose. When small groups of people meet and start talking together they tend to arrange themselves in a circle. Thus, if the system can sense the proximity of users with techniques such as ProxNet[3], it becomes possible to match position around the table with directions from one user to another.

CONCLUSION

DataJockey provides a simple and natural way to exchange data between mobile devices. Its use has been demonstrated using a photo album application. In addition to providing a useful functionality and being enjoyable to use, the communication and negotiation needed to coordinate the movement of the virtual table may facilitate the social cohesion among groups of DataJockey users.

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