

An Intuitive Data Transfer Technique using Bartender's Gestures

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ABSTRACT

This technical demonstration presents *Cocktail*, a gesture-based mobile interaction system, which is designed for providing a user-friendly way of exchanging multimedia data with intuitive gestures. Our system is motivated by bartenders who make cocktails with interesting gestures, such as pouring and shaking. These gestures are used in our interaction system for data transfer and contents creation: a user can pour (transfer) data in his/her mobile phone to other devices in the same way that a bartender pours drinks to a shaker. The user can also mix music files and pictures into a multimedia content, such as a music video file, by shaking the mobile phone, as a bartender does to mix different drinks into a cocktail. We have implemented a prototype of *Cocktail* using smart phones and demonstrate its usability.

Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces—input devices and strategies, interaction styles

General Terms

Design

Keywords


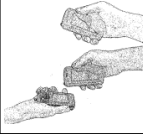

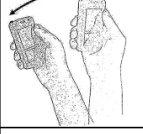


Data transfer, gesture, mobile interaction, shaking

1. INTRODUCTION

Most mobile phones are capable of creating new multimedia data. Because mobile phones are equipped with high resolution cameras and microphones, users can take pictures or make movies anytime, anywhere. However, exchanging or sharing those data with other users is still challenging. Transfer of pictures from one mobile phone to another usually takes several inconvenient steps: pressing buttons to execute file exchange program, selecting and enabling radio interfaces (e.g., IrDA, Bluetooth) followed by wait time for identifying the target phone's address (e.g., Bluetooth MAC address), selecting the pictures to be transferred, and pressing the 'transmit' button. To enhance interactivity of mobile devices, it is essential to devise novel solutions for exchanging multimedia data in more user-friendly ways.

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Table 1: Comparison of the gestures used in a bar and in our system

In a bar		In our system	
	Pouring drinks to a shaker or a glass		File transfer
	Mixing drinks to make a cocktail		Making a music video
	Hand over glasses or bills		File transfer to stationary devices and quick execution

This paper describes a gesture-based mobile interaction system, *Cocktail*, which is designed for intuitive data transfer and contents creation. Motivated from bartenders who mix drinks to make cocktails in an interesting way, our system mimics their gestures for mobile interaction: a mobile user can pour (transfer) data from his/her device to other devices, just like a bartender pouring drinks to a shaker. If the user has some pictures and music files in the mobile phone, he/she can mix them into a music video file by shaking the mobile phone, as a bartender does to make a cocktail. In addition, our system also provides the 'pushing' interface for interaction among stationary devices. The pushing gesture is used by bartenders to handover glasses or bills to customers in a real bar. Similarly, in our system, a user can transfer a file on a touch-screen to other stationary devices (e.g., printers) by pushing (dragging) the file icon towards the physical position of the target device. The gestures used in a real bar and in our system are compared in Table 1.

Section 2 present the system architecture. Section 3 describes the implementation and demonstration scenario. Finally, Section 4 gives concluding remarks and future works.

2. COCKTAIL SYSTEM

The overall *Cocktail* system is shown in Figure 1. It consists of mobile phones, a touch-screen called SmartTable, and various stationary devices, such as a display, printer, or

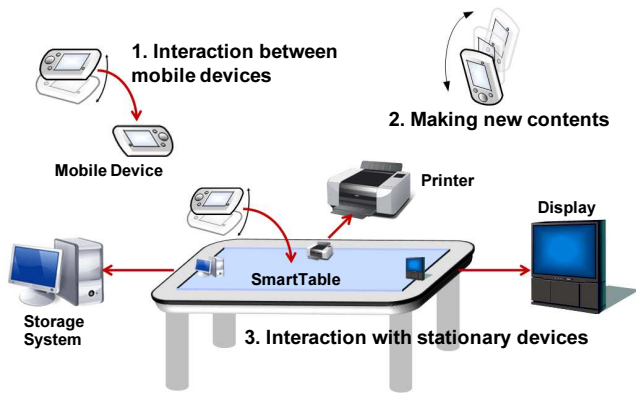


Figure 1: An example of Cocktail system.

storage server. The devices shown in Figure 1 are mapped to the physical objects in a real cocktail bar. For example, a mobile phone is mapped to a bottle, multimedia contents in the mobile phone represents drink in the bottle, and SmartTable is mapped to a table in the bar.

Our system provides three types of interactions: (1) data transfer from a mobile phone to another device, (2) creating new contents, (3) data transfer from SmartTable to stationary devices.

Related to the first function, we use the sprinkling gesture (which is similar to the pouring gesture) in order to transfer data. Figure 2 illustrates the concept of sprinkling interaction: when a user wants to send pictures in her mobile device to other devices, she can transfer the pictures by sprinkling her mobile device above the target device. We have implemented a tiny sensor module for recognizing the sprinkling gesture and the proximity between two devices. The sending device transfers the data to the device which is closest to it. The proximity detection module of the Cocktail is one of the most important components whose primary function is to ensure a close proximity status. In this work, we deploy an acoustic-based proximity detection module. It can operate in a peer-to-peer way without support of any pre-deployed infrastructure. It is a pure application-layer solution which uses only the most basic set of commodity hardware - a speaker, a microphone so that it is readily applicable to many low-cost mobile platforms like cell phones and PDAs.

As the second function, we use the shaking gesture in order to make new contents by mixing contents that we already have. For example, if a user selects a music file and some pictures in her mobile device and shake the device, a new content, like a music video, is automatically created. The concept of shaking interaction is shown in Figure 3.

For interaction with stationary devices, we have designed SmartTable which contains a touch-screen monitor. Because it also has the same function which the mobile devices use when receiving data, we can send the data to SmartTable by sprinkling a mobile device above it. In addition to this, SmartTable allow users to interact with stationary devices around. We assume that some relatively large-size electronics, such as a TV, printer, or PC, are rarely moved, so that we can register their position into the database in SmartTable. We additionally make the icons of those stationary devices on the touch-screen in order to let users know the

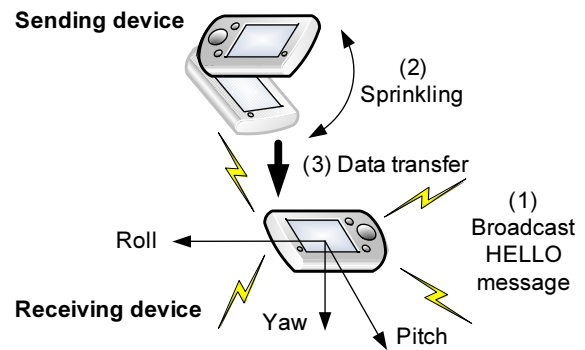


Figure 2: Data transfer with the sprinkling gesture.

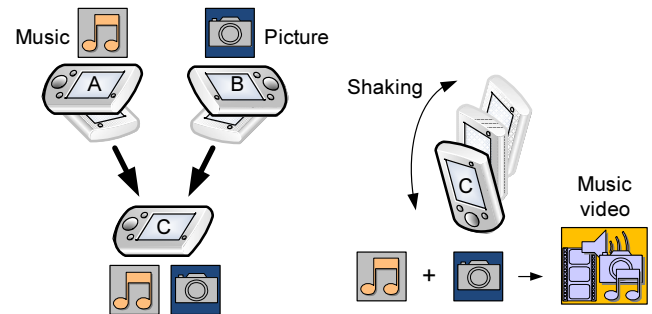


Figure 3: Creating a music video by mixing a picture and a music file.

real devices' physical location. By pulling the contents such as movie, music, and picture to the direction of icons on the touch-screen, we can start the mapped action.

3. DEMONSTRATION

We have implemented a prototype to demonstrate the usability of Cocktail system. We employ three smart phones (two Samsung Omnia [1] and one HTC Touch Diamond [2]), one touch screen as a SmartTable, and a printer as a stationary device. Each smart phone runs Microsoft Windows Mobile 6.1 and has a 3-axes accelerometer, Bluetooth and WiFi. We sample the 3-axes acceleration of each smart phone every 200 msec and implement gesture recognition program. To detect the target device, we simply use RSSI-based approach shown in Figure 2.

4. CONCLUSIONS

This paper presents Cocktail, a new gesture-based interface for mobile devices, which is motivated by bartenders. Pouring actions will transfer data from one device to the other and shaking the device will mix the multimedia data to a music video. We have implemented a prototype of Cocktail and demonstrate its usability.

5. REFERENCES

[1] Samsung, Omnia, Smart Phone, <http://omnia.samsungmobile.com/omnia/>.
 [2] HTC, Touch Diamond, Smart Phone, <http://www.htc.com/www/product/touchdiamond/>.