
Touch and Copy, Touch and Paste

Pranav Mistry

MIT Media Lab
75 Amherst Street
Cambridge, MA 02139 USA
pranav@media.mit.edu

Suranga Nanayakkara

MIT Media Lab
75 Amherst Street
Cambridge, MA 02139 USA
suranga@media.mit.edu

Pattie Maes

MIT Media Lab
75 Amherst Street
Cambridge, MA 02139 USA
pattie@media.mit.edu

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Abstract

SPARSH explores a novel interaction method to seamlessly transfer data between digital devices in a fun and intuitive way. The user touches whatever data item he or she wants to copy from a device. At that moment, the data item is conceptually saved in the user. Next, the user touches the other device he or she wants to paste/pass the saved content into. SPARSH uses touch-based interactions as indications for what to copy and where to pass it. Technically, the actual transfer of media happens via the information cloud.

Keywords

Copy and Paste, Touch-based Interaction, Data Transfer, Intuitive Interfaces

ACM Classification Keywords

H.5.2 [Information interfaces and presentation]: User Interfaces. – Input devices and strategies; Interaction Styles

General Terms

Design

Introduction

In Hinduism, people often create a colored mark called Tilaka¹ on forehead by simply touching a colored

¹ <http://en.wikipedia.org/wiki/Tilaka>

powder in a container and touching their forehead. In SPARSH, we explore this metaphor to “copy and paste” data between personal digital devices using similar touch based interaction. The problem of moving digital media between common digital devices such as notebook computers, PDAs, smartphones, digital white boards and others has been well studied [2]. USB drives, external hard disks or online Dropbox [1] are some of the common ways to move files or media from one device to the other. In addition, there have been attempts to make the transfer of digital media more tangible and interactive [3, 5]. However, these interactions are not as intuitive as making a Tilaka.

Our digital devices are now increasingly relying upon the cloud, the cloud of information. In addition, touch is becoming a more common way to interact with these devices. SPARSH lets you conceptually transfer data from one digital device to your body and pass it to another digital device by simple touch gestures. Technically, the actual transfer of data happens on the cloud as shown in figure 1.

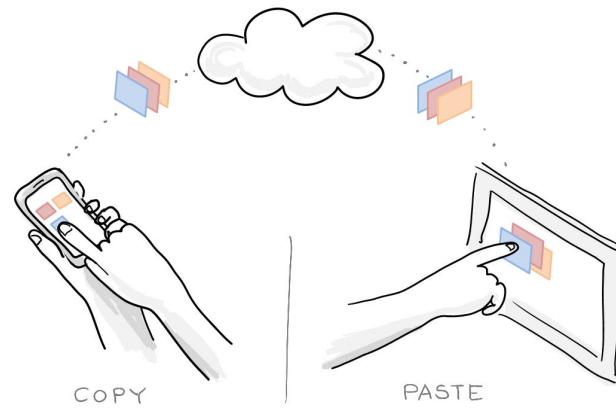


figure 1. SPARSH – Touch to Copy, Touch to Paste

SPARSH Interactions

Here are a few example scenarios that the current SPARSH prototype supports.

Scenario 1

Imagine you received a text message on your mobile phone from a friend with the address you are meeting him at. You touch the address and it gets conceptually copied in you. Now you pass that address to the search bar of Google Maps in a web browser of your computer by simply touching that [figure 2].

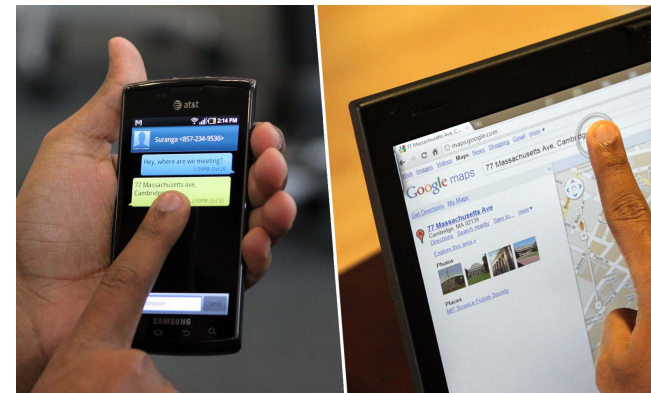


figure 2. Transferring an address received in an SMS from a mobile phone to Google Maps on a computer.

Scenario 2

You want to contact a person whose contact information was found while browsing a website on your computer. You copy the phone number on the screen by touching it; now rather than manually typing that phone number, you can simply pass it to your mobile phone dial pad by touching [figure 3].

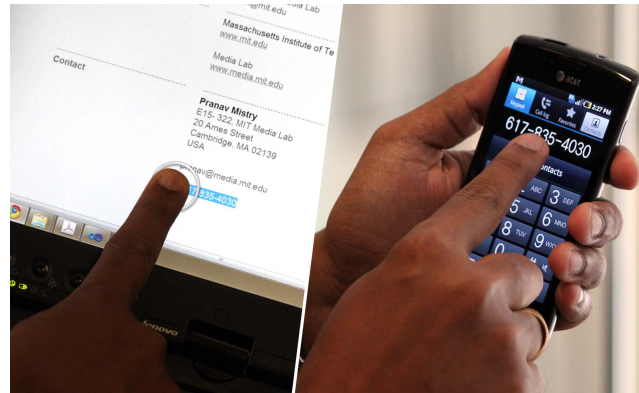


figure 3. Copying a phone number from a computer to a mobile phone.

Scenario 3

Want to share some pictures that you took using your camera to your friend's tablet computer? Select the pictures you want to copy from the camera by touching them and then pass them to the tablet computer by touching the screen of the tablet [figure 4].



figure 4. Copying pictures from a phone to a tablet computer.

Scenario 4

You see a video link posted on Facebook on your mobile phone. But you do not want to watch the video on the small mobile phone screen. Simply touch the link, pass it to a larger screen by touching it and enjoy the video [figure 5].



figure 5. Moving a video link from a mobile screen to a larger digital display.

In the scenarios discussed above, SPARSH proposes a novel way of data transfer between personal digital devices belonging to a single user. However, in the case where a device is shared by multiple users or a user wants to pass data from his personal device to another user's personal device, the question of user identity arises. SPARSH uses a "gesture signature", a user-defined unique pattern drawn on the screen, to distinguish one user's copy-and-pastes from another user's copy-and-paste act (as shown in figure 6).

Implementation

In SPARSH, when a user touches some text data or other visual representation of a data, it is recorded as

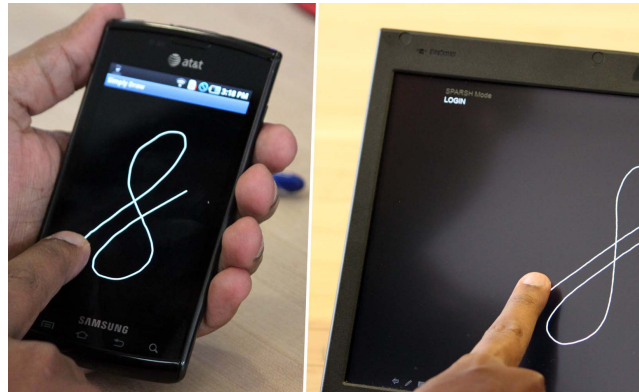


figure 6. Identifying user by using a unique “gestural sign”.

“copy”. The user next touches another one of their devices which triggers a “paste” of the data that was just previously copied. The actual data could either have been stored in the cloud already, so that it can now be retrieved to the second device from the cloud. Alternatively, when the “paste” act happens, the item could be copied from the original device to the destination device directly. The SPARSH system requires that the devices have touch screens and that they are networked so that they can communicate copy and paste events.

Our current prototype SPARSH system is set up on two mobile phones running Android 2.1, a tablet PC running Windows 7 and a 36-inch touch screen display. The data cloud runs on an FTP server, where each user has a folder with a unique ID. The user has to run the SPARSH application on the device (mobile phone, tablet PC or touch screen display) and sign-in by drawing a unique pattern on the screen. This is implemented using a “\$1 recognizer” [4]. Typically, a user stays “signed in” on their own devices, unless someone else

signs in. Thus, normally, a user has to perform only two acts, a copy and a paste to transfer data between their own personal devices. In SPARSH mode, if a user touches a data item on screen (a picture, video link, text, etc) it gets uploaded to his folder on the FTP server. If the user touches a paste-able area on screen (search bar, blank space in a folder, etc), SPARSH retrieves corresponding data from his folder on the ftp server. Users can copy multiple items by touching them in sequence and when pasting, data retrieves in the same order as they were copied.

Conclusion

We believe that SPARSH offers an interesting way of transferring media between our personal digital devices. Users can conceptually copy data into their body from one device and pass it to another by natural touch interactions.

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