Available online at www.iseec2012.com

I-SEEC 2012

Proceeding - Science and Engineering (2013) 143–146

Proceeding
Science and Engineering

www.iseec2012.com

Science and Engineering Symposium
4th International Science, Social Science, Engineering and Energy Conference 2012

Sharing Photos by Fingertips Touch with Multi-touch Table for Android Smart Phones

S. Mitatha[a,*], C. Vongchumyen[a] , N. Boonjeed[b] , P. Poengam[b]

[a]*Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520, Thailand*
[b]*Faculty of Engineering, Kasetsart University, Si Racha Campus, Chonburi,20230, Thailand*

Abstract

Sharing photos by fingertips touch with multi-touch table for Android smart phones is a compound Multi-touch technology and android application for transferring pictures between android smartphones using multi-touch screen to control. Moreover, users can add photo effects. This project can be divided into 2 partitions: the multi-touch table application and android application. In the first partition, a multi-touch screen is located on the table so that the user can use it comfortably. Multi-touch table application is a photo effect and transfer data program. For the second partition, android application is the application used for connecting with the multi-touch table application. This multi-touch screen project has a lower cost than the ready-made screen in the market. Furthermore, the project can respond to the need of users in different fields and areas in society including the entertainment and creative industries. The multi-touch screen is a large-sized device so it can be used by users comfortably. Another interesting feature is that users can converse with others while using it.

Selection and/or peer-review under responsibility of Faculty of Science and Technology, Kasem Bundit University, Bangkok.

Keywords: Multi-touch table, Android, Smartphone, Infrared LED, Touch screen

1. Introduction

Nowadays, the reaction of users' requirements to send and receive smart phone data still needs to be improved and be presented with outstanding updated styles. So, the approach which be presented is adding media. Senders and receivers must connect with an intermediary instead of directly connecting between themselves. After users connect with the intermediary, the transmission will support connecting many users (2 persons up) simultaneously.

The distinctive feature in this program is the compounding of the multi-touch screen with the smartphone data transmission. Users can apply many objectives at the same time such as customizing and exchanging photos between users, uploading photo to social networks by a control with multi-touch table.

* Corresponding author. *E-mail address:* kmsomsak@kmitl.ac.th

Fig. 1. Multi-touch table

Fig. 2. Adding media to send and receive data, The structure of the data to the application

2. Principles and Theory

2.1 Windows touch [1, 2]

Tools and new API in Windows 7 operating system support data receiving from touch Input such as support multi-touch from multi-touch screen. Windows 7 presents some functions and properties called "**Message**" that is a reporter and a follower touch Input. Message can be divided into 2 sections via WM_TOUCH and WM_GESTURE. The operating system will create "Message" and send this to an application which supports multi-touch. WM_TOUCH is a simple touch message created by a user simply by dragging and moving. WM_GESTURE is an action touch message created by zooming and rotating.

2.2 Multi-touch Technology[3,4,5]

Frustrated Total Internal Refection (FTIR) is a kind of multi-touch technology that uses Optical Multi-touch technic that was developed by Jeff Hann. Han' method is a light phenomenon. The important finding from Han's method is the "**Total internal reflection**".

Hann applied Total internal reflection with acrylic by using infrared project to the border of acrylic so that light cannot pass through. But when a person touches the acrylic surface, infrared can pass through by compound at touch points as fingertips (as shown in Fig. 3).

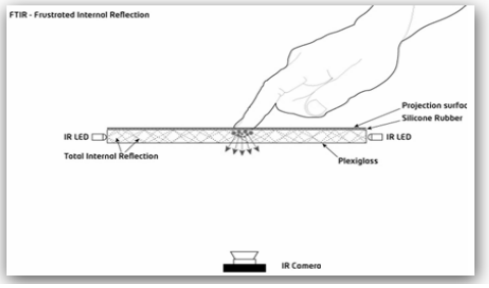

Fig. 3. Frustrated Total Internal Refection (FTIR)

3. Design and Operation

3.1. Overview

Sharing photos by fingertips touch with multi-touch table for Android smartphone is divided into 2 sections, the Multi-touch table section and smartphone section, by focused Multi-touch table development.

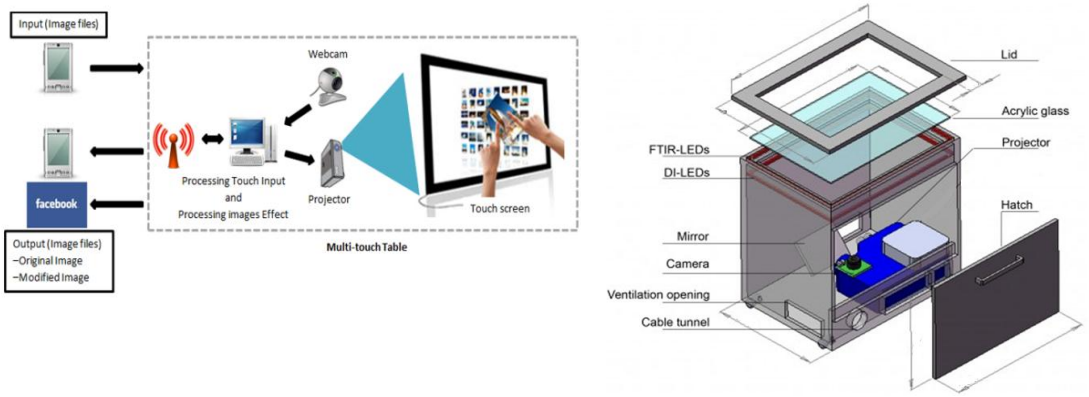

Fig. 4. Overview of Multi-touch table, Multi-touch table structure

When a processor receives video frames, **Communicate Windows Multi-touch program** will process location(x,y) which is touched by a user. The RGB rate and threshold depend on the ambient light.

RGB average rate as

- R average - 80-100
- G average - 110-130
- B average - 150-170

Considering locations (x,y) begin with scanning each frame for pixels, that like RGB rate, is set by a user. When the desired point is found, it will create the border of those points. Then it considers the center of each point as the location of point. Then a location packet is sent to a driver for sending message to an operating system.

Windows 7 Ultimate has a function to support touch up to 255 points at the same time. Operating system manages message which include the events as click drag or drop etcetera on that location. The events respond on Multi-touch Application, as they connect with Android Application. When connected, the smart phone application will send photos from the SD Card to the Computer. The program will show photos that are received in the user's area.

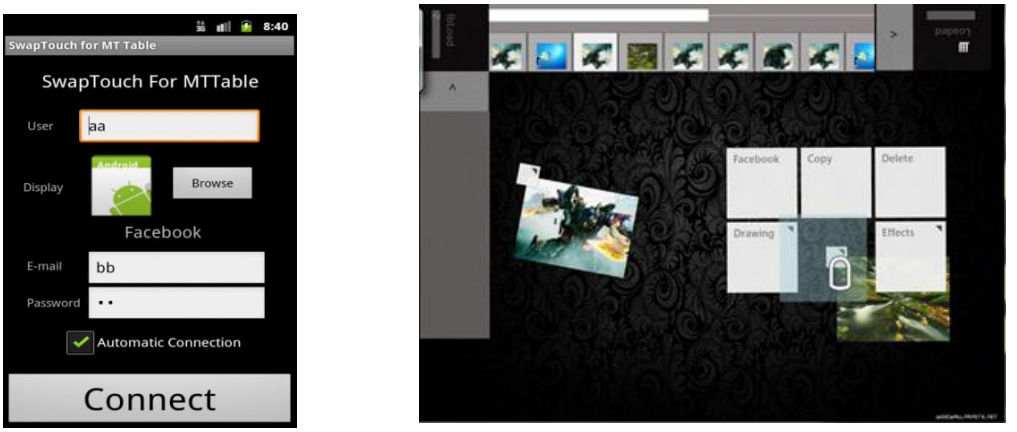

Fig. 5. Smartphone interface, Multi-touch table application

3.2. Limitation

(1) The work area has to constrain the brightness of the light that is appropriate with the indoor area.
(2) Calibration has to be accurate so the calibrator should be exceptionally careful.

4. Results

5 functions implemented are:

1. Connection between smartphones and multi-touch table
2. Copy photos and send to another
3. Drawing function
4. Photo effect function
5. Upload photo to facebook

5. Summary

Sharing photos by fingertips touch with multi-touch table for Android smart phone is focused to applying multi-touch with mobile application to create and increase novelty, creativity, piquancy and convenience of data transmission. Through this project, sending and receiving data will become faster and easier. Furthermore, sharing photos by multi-touch table can create an activity that intensifies networking relationship between user groups because they can use it together at the same time. Sharing photos by fingertips touch with multi-touch table for Android smart phones can be applied to develop more advanced technologies.

Acknowledgements

The research received an Honorable Mention Award in Program for science and technology development at 14th National Software Contest 2012, NSC 2012.

References

[1] http://msdn.microsoft.com/en-us/library/dd371413(v=VS.85).aspx
[2] http://msdn.microsoft.com/en-us/library/dd371406(v=VS.85).aspx
[3] http://en.wikipedia.org/wiki/Multi-touch
[4] http://lowres.ch/ftir/
[5] http://nuicode.com/attachments/download/115/Multi-Touch_Technologies_v1.01.pdf