

Balancing Displays on Mobile Projectors

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ABSTRACT- Most of the smartphones which we have today is embedded with a projector on top of the phone. These projectors are widely used by most of the people for displaying images, giving presentations, watching videos and many other purposes. The developing smartphones gives new way of display for the users. The main problem with these projectors is that they can't be used along with phone screen. The projectors are placed above the mobile. So this method allows the user to use the mobile and the projector at the same time. They can interact with their mobiles and the projector at the same time. Then it will be difficult for the user to relate the projected information in their phone's screen. This paper shows the methods to change the displaying angles of the mobile projectors. It will be done dynamically and user can perform different tasks even while using the projectors. Three main techniques have been described in this paper.

Index terms – Angle, Display, Interactive, Mobile, Projectors, Screen, Videos, View

1 INTRODUCTION

The handheld projection technology has been widely increased and it has become the main selling factor for the mobile phone manufacturers. It still remains as a question as to how the projectors can be used along with phone screen. It has become a new opportunity for the ecology of the mobile projectors. The design of the mobiles can be changed in such a way that they can support or balance the displaying angles of the projectors that are embedded on it. The screen of the phone should be placed in relative to the embedded projectors. The placement of the projector is mainly constrained to the already existing mobile phone screens. The recent way of keeping the projectors is positioning it on top of the mobile so that they provide the particular image or video at right angle to the viewing angle of the screen. This makes the user difficult to view both the projection and the phone screen at the same time. Only one of the things can be concentrated at a time. This problem does not occur if the projection is used only for public interactions and the phone screen is used for personal purposes. But if they user need to access or view both the sides then the displays have to be changed accordingly. The users can choose as to which display has to be used for public and personal purposes with the help of a dual display.

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The problem can be fixed by physically separating the projector from the phone and using it as a Pico projector. But this upturns the requirement for more cost, much power is required, the control of the user and extra hardware equipment to handle the video signals. And this precludes the projectors from getting the advantages of the handsets such as the touch screen, the camera and the accelerometer. The user would be able to configure the phone and adjust the displaying angles of the projectors

depending on the various operating modes of the projector phones. Usually the images or any form of media is projected on a wall. Presentation applications are performed in the above mentioned method. In this paper the configuration with respect to the projector and screen that can be varied is discussed. A suitable technique can be used by creating different combinations and positions of the projectors.

2 DESIGN

In this segment the various ways of integrating the mobile projectors with the phones is explored. The angle of projection or the throw angle can be modified by the users by choosing the suitable positions according to their usage of content.

The documents that comes under the private, public or the semi-public are projected accordingly. The mobile phones and the personal digital assistants contains personal information such as the contact details, messages, emails, images or videos would find it difficult to be used if context switching is done. A solution can be obtained for displaying such personal media by determining the relationship between the projected display and the phone screen.

This users can decide where to display the content i.e., a small projection area or a larger one. The location selected by the user depends on the physical constraints of the surface. The appropriate projection angle depends on the application features.

3 IMPLEMENTATION

The projection hardware can be physically coupled to the display using a pivot. The angles can be varied by using electronically driven operation. But they might contain

some wear and tear when installed in such a way. A rotating mirror can be used to control the projector. This is not yet implemented in any of the smartphones. It is just an idea which can be very useful for the users. The motor or the mirror cannot be directly manipulated as a technique for interaction. The projection might be blocked if the mirror is used by hand. So it is difficult to control it physically.



4 SETTINGS

There are three main scenarios which depicts the various projecting angles. The design allows the usage of both the phone screen and the projection. Different ways of adjusting the angle of projection should be supported by the device.

1. In this scenario the screen alignments are done. The visual alignment of the screen is very important. It is performed when the image is projected on a wall. Different properties of the display can be explored by changing the alignment back and forth. The user can decide whether the image has to be displayed on the screen or on the projection. Even though the projector provide us with an enlarged view of the image than that of the image in a phone screen, it still lacks the brightness and the clarity compared to the phone screen.



2. The manipulation of the projection can be shared. The projection can be controlled through the phone

screen instead of using the projection itself. In case if the user want to project something but doesn't want other people to look at it this method can be used. The projection can be given to a table or a desk. It provides the user with some privacy. More than one user who has similar type of device can join their projections as one and interact with it. This is more commonly used while giving any presentations.

3. In order to get both private and personal map information a projection on the floor can be done. In the meantime the user can use the phone screen for other purposes also. The bystanders can use the related information and they could still use their phones to do other things. The usage of map applications is made easy by adopting this technique.

5 CONCLUSION

The various uses of balancing the displays in a mobile projector phone is discussed in this paper. Techniques for using both the projection and the phone screen at the same time is one of the needs of the customers. This might be implemented in the upcoming and more developed mobile projectors phones.

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