Review Article | Impact Factor: 0.621 | ISSN: 2319-507X
Vijal Raja, IJPRET, 2014; Volume 2 (9): 1111-1116 | IJPRET

INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

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TACTUS TECHNOLOGY-TAKING TOUCH SCREEN TECHNOLOGY INTO A NEW DIMENSION

VIJAL. S. RAJA[1], DR. H. R. DESHMUKH[2], PROF N. S. BAND[3], PROF Z. I. KHAN[3]

1. M. E. First Year, Department of Computer Science & Engineering, IBSS College of Engineering, Amravati.
2. Prof and HOD, Department of Computer Science & Engineering, IBSS College of Engineering, Amravati.
3. Asst. Prof, Department of Computer Science & Engineering, IBSS College of Engineering, Amravati

Accepted Date: 27/02/2014 ; Published Date: 01/05/2014

Abstract: Touch screens have greatly improved the way users interact with devices, making them more intuitive and easier to use, but they come with a price. The absence of tactile feedback creates a host of problems, which negatively impacts user experience on a variety of levels. Device manufacturers are trying to address this issue through a wide range of solutions that attempt to simulate a physical button experience.

Keywords: Visual Cryptography (VC), Halftone, Dithering

PAPER-QR CODE

Corresponding Author: MR. VIJAL. S. RAJA

Access Online On:

www.ijpret.com

How to Cite This Article:

Vijal Raja, IJPRET, 2014; Volume 2 (9): 1111-1116

INTRODUCTION

Vibration-based haptics for instance, uses vibratory feedback to mimic the feeling of resistance when a virtual button is pushed. This approach cannot, however, recreate the true tactile response of an actual button press – a fact not lost on device makers such as Samsung®, Nokia®, RIM® and others that continue to develop physical keyboards for their products (even at the expense of user preference for more screen real estate and thinner devices).

Current haptic technologies also fall short in assisting users in properly locating their fingers on the screen or keyboard, because of the inherently flat nature of touch screens. Without proper orientation, mistakes will be high. Given how fast touch screens are being integrated into handheld devices such as digital cameras, gaming systems and smart phones to larger systems such as cars, medical devices, ATM's and home controls, it is vital to have a tactile solution that helps users interact with them much more naturally, comfortably and safely, as is the case in automotive applications,.

PROBLEM:

Lack of Compelling Human Interaction Severely Compromises User Experience

Data entry errors, poor typing speeds and the inability to even know if an input has been made are just some of the problems that plague users using touch screen keyboards and touch input devices today.

Interacting with a touch screen requires constant visual monitoring; a person needs to take their attention off whatever they are doing to focus on the input interface. Merely inconvenient in situations like playing games, this can be actually dangerous in an automotive environment where touch screens are used for tasks such as changing the radio station or interacting with the navigation system. The lack of physical buttons that prevents a person from feeling where they are also makes it impossible for the user to blind navigate (enter data without looking at the screen) or touch type.

Arm and finger fatigue is a common occurrence due to constant hovering, and even a slight adjustment requires a user to look at the screen to reposition their fingers. More importantly, entire segments of the population who can't operate touch screens are left behind. The blind and visually impaired, the elderly, those lacking fine motor skills because of diseases like arthritis or Parkinson's either struggle or find themselves completely unable to use 'button less' touch screen based devices.

SOLUTION:

The Tactus Tactile Surface, A Deformable Physical Layer That Provides Users With Tactile Feedback

Tactus Technology, Inc. has developed a patented solution to address all these issues.The Tactus Tactile Layer™ panel provides a next-generation user interface with real physical buttons, guidelines, or shapes that rise out of the surface of a touch screen on demand. The Tactile Layer component is a completely flat, transparent, dynamic layer that sits on top of the touch sensor and display. When triggered, this thin layer deforms and buttons or shapes of a specific height, size and firmness appear on the surface. Users can feel, press down and use these physical buttons just like they would use keys on a keyboard. When they are no longer needed, the buttons recede into the surface and become invisible.

The Tactus panel is the world's first deformable tactile surface that creates dynamic, stable, physical buttons that users can actually see and feel, in advance of entering data into the device. Covered by more than 22 granted or pending patents, it uses innovative micro fluidic technology to create physical buttons that rise and recede to give users the experience of interacting with physical buttons. It allows different pre-configured button arrays such as a QWERTY keyboard, to be raised or lowered. Not just limited to keyboards and on-screen buttons, the tactile technology can also be integrated off-screen, such as on the backside of a device or on a car door panel.

RESULT:

A Truly Tactile Surface That Enables New Applications And Devices

The Tactus Tactile Layer component provides Original Equipment Manufacturers (OEMs), Original Device Manufacturers (ODMs) and display companies with the ability to make touch screen devices that offer true tactile feedback to the end user. Not only can users or the software control when buttons appear and disappear, but the technology also enables them to rest their fingers on the buttons and enter data by actually depressing a real button.

Physical buttons have the potential to increase typing speeds, reduce data entry errors and make touch-typing and blind navigation on a touch screen possible for the first time. It allows for the screen and keyboard to be combined into a smaller form-factor. Not having to reserve a separate space for buttons or keys also enables manufacturers to increase the size of their LCD displays and create entirely new forms of devices.

It is possible to create almost any type of button configuration or layout on a panel, and that configuration is set in the manufacturing process. Multiple button sets can also be pre-

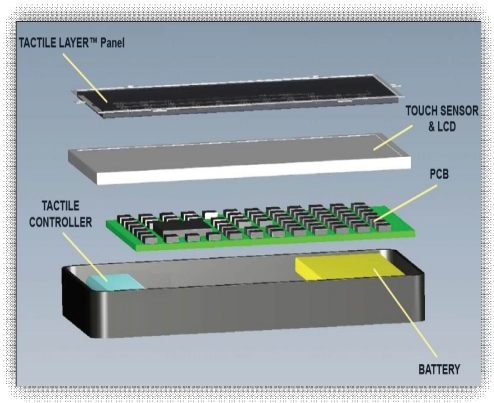
configured on a single panel, enabling different groups of buttons to be raised at different times, depending on the interface needs of the user.

Power requirements of the Tactile Controller used to actuate the panel are minimal. The system only consumes a small amount of power to raise or lower the buttons. Once the buttons are raised, they remain enabled for as long as they are needed – be it a few seconds or several hours – without any additional power consumption. This is possible because the pressure used to raise the buttons remains present, causing the buttons to automatically pop back up each time they are pushed. In contrast, haptic vibration-based solutions consume battery power each time a vibration is made.

Coatings similar to those used on touch screens can also be used on the tactile surface to make it anti-fingerprint and scratch proof. Even if the touch screen cracks, the tactile surface will function normally if it isn't damaged since it is independent of both the touch sensor and the LCD screen.

Easy to Integrate:

Manufacturers do not need to re-engineer their display stacks – the Tactile Layer panel simply replaces the front layer of the display stack, known as the cover lens or window. The layer is the same thickness as the layer it replaces and requires little or no change to the underlying touch sensor or display. The size is scalable from that of a mobile-phone screen to a TV screen. It works with existing touch sensing and display technologies, consumes little power, and offers customizable button locations, shapes and layouts.



Improves The Accessibility Of Touch-Enabled Devices:

With Tactus- enabled products, the visually and physically impaired can feel real physical keys, dramatically increasing their ability to use mobile and CE devices.

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Covered by multiple core patents, Tactus' technology enables real, physical buttons to rise out of the surface of a touch screen when needed and recede back into the surface...

CONCLUSION

Tactus Technology, Inc. has developed a patented solution to address all these issues. The Tactus Tactile Layer™ panel provides a next-generation user interface with real physical buttons, guidelines, or shapes that rise out of the surface of a touch screen on demand.

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ACKNOWLEDGMENTS

The authors would like to thank Department of Computer Science Engineering IBSS College of Engineering Amravati for their support of this experimental project.

Authors also extend my sincere thanks to all other members of the faculty of computer science engineering department and our friends for their co-operation and encouragement.

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