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Laser Projection Virtual Keyboard

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Abstract- At the point when PCs were developed, they were enormous and created many issues due to their humongous size and weight. With the headway in innovation, pretty much every part of a PC got improved with the decrease in size, better execution, quick reaction, and expansion of new high-level elements. Yet, the console is the main part that remained almost the same throughout the long term. The customary console has a scaling down issue, and there a requirement for upgradation, so we pick a possibility for a virtual console. In this book approach, when the typist types, finger developments will be followed by the camera to get the keystroke and send the composed characters to the PC. A Laser Projection Virtual Console is a console having the part of the product that the client utilizes by essentially pushing on the region utilizing a remote or optical perceivable surface as opposed to by discouraging actual keys.

keywords: Virtual Keyboard, Laser light, Infrared light, Sensor, Projection and Ultrasonic Sensor

1.INTRODUCTION

A virtual console is a PC input gadget that is worked by composing (discouraging movement of fingers) on a remote or optical-discernible surface or region rather than squeezing actual keys. The client essentially pushes down or contacts keys showed in the picture of the console, which is projected by the virtual console gadget. An optical gadget identifies the stroke which is squeezed by the client and sends it to the PC. A Projection console lays out a association with different gadgets utilizing Bluetooth Innovation or by USB. It very well may be associated with different gadgets, for example, cell phones, PCs and smaller than normal PC gadgets with iOS, Windows, or Android stages [1].

This gadget is really a key-in gadget in light of profoundly high-level laser innovation; roughly a size of a wellspring pen, a console of standard size is projected onto a level surface. This is the furthest down the line innovation to take out finger squeezing. Using laser innovation, a gadget such as a handheld gadget, is utilized to project a block red picture of console. The idea of optical acknowledgment is utilized to distinguish and permits clients to tap on the extended keys by the gadget so it acts like a genuine one. This new creation will turn into a shelter in the field of portable PCs who do like in-typing by memory as opposed to squeezing over little keys [2]. Laser Console frameworks will currently in additional to do the working of Mouse also. We have self-carried out and constructed Laser Projection Virtual Console utilizing an innovation that incorporates reverberation sounds and general strategies that are utilized for the execution and development of this console. We surmised far to work on this console and a few substantial changes.

2. DEVELOPMENT

A Virtual Console was concocted and protected by IBM engineers in 1992. In 2002, new business Canasta concocted a projection console utilizing their selective "electronic discernment innovation". The organization subsequently authorized the innovation to Callion of Korea [3]. Canasta has added click sounds that emulate genuine composing, to help clients with better and further developed utilization. Presently, this gadget is accessible in different variants and produced by various organizations like Serafim, Gangu, Microwave, Tobo, and Premium AV.

3. APPROACH

3.1 Connecting the Keyboard

The Virtual Console can be associated with a PC by the same token by wire mode like USB links or by remote modes like
Bluetooth.

3.2 Light Emission

At the point when the Console is appropriately associated with a PC, the laser light producer extends a design of the console on the surface alongside infrared light on a similar area of console projection. This infrared light isn't noticeable to the client and floats a not many distances over the surface [4]. This plane is put simply lined up with or more the outer layer of the console format projection.

3.3 Reflection Process

At the point when the client contacts the vitals' situation on the connection point, the light gets reflected from the client's fingers and environmental factors of the key. This mirrored light is coordinated towards the sensor.

3.4 Displaying Output

In the wake of getting the mirrored light, the sensor sends the signs to the PC and a product change over the directions of mirrored light to recognize activities and **characters, in this** manner shows the composed characters on the
screen [5].

The basic approach workflow is shown in Fig -1.

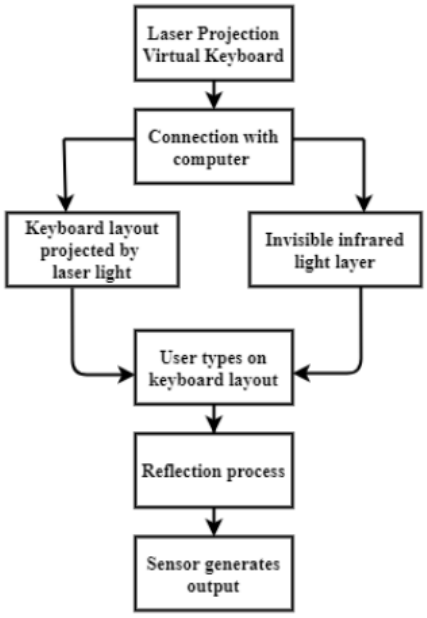

Fig -1: Workflow Diagram

4. DESIGN

The Virtual console is for the most part cuboidal in shape, with one front surface projecting the laser light on the dark level
surface. The general aspects are 8 cm level, 5 cm length, what's more, 3 cm width and it is a lightweight gadget with a load of around 70 grams just, which makes it versatile.

4.1 Components

It has three primary parts Laser Light Producer (design projector) which is situated at the top, Sensor in the center, also, an Infrared Light Producer at the lower part of the Virtual Console gadget [6].

4.1.1 Laser Light Emitter

The Laser Light Producer is a little gadget that discharges light through the course of optical enhancement. Prior to the light
emerges from this minuscule gadget, it goes through a Diffractive Optical Component that has a microstructure of a norm console format. Laser Light Producer is likewise called an example projector as it gives a console design on a level and dark surface.

4.1.3 Sensor

The sensor changes over the mirrored light into electronic information what's more, sends the information for additional handling. It is the part liable for following the finger developments and speculating the squeezed key. It likewise has a USB port or different ports in view of the network choices. The plan is displayed in Fig - 2 beneath.

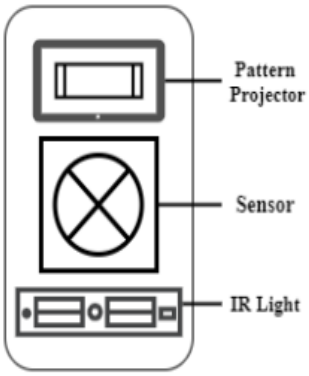

Fig -2: Virtual Keyboard Design

5. WORKING

The Laser Light Producer or Patter Projector has a Diffractive Optical Component which is having a complex microstructure that spreads the laser light and undertakings the design of the console on the level dark surface. The Infrared Light Producer makes a meager layer of Infrared light a couple of millimeters over the level surface. Whenever we contact any key on the projected console the Infrared Light gets reflected from our finger and returns to the console's sensor and the sensor identify the area (directions of a 2-layered plane) of our finger and tells which key we have contacted [7]. It can recognize numerous keys at a time. The recognized signs are shipped off the PC and the result characters are shown on the PC screen.

Fig -3 shows the working of all three main components, that are Laser Light Emitter, Sensor, and Infrared Light Emitter.

Fig - 4 shows how the console format depends on a 2-layered plain with x and y arranges, that are utilized by the sensor to recognize the area of finger strokes.

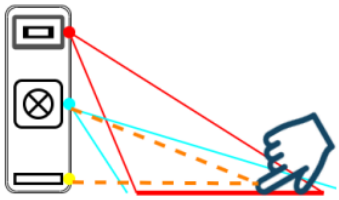

Fig -3: Working of All Three Main Components

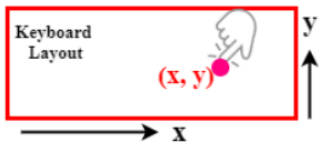

Fig -4: 2-Dimensional Keyboard Layout with x and y coordinates

6. SELF IMPLEMENTATION

We have executed the Laser Projection Virtual Console utilizing a philosophy that incorporates reverberation signals. We have
utilized an Ultrasonic Sensor, a Bluetooth module (HC-05), Console Design Projection Laser, a screen (show), and in particular Beagle bone Dark Fire up C. Beagle bone Dark Fire up C is a low fueled single board PC. It measures around 75 by 75mm. It has 512 MB DDR3 Slam, the processor clock speed is 1 GHz, HDMI, and 4 GB of eMMC streak memory. Beagle bone Dark Fire up C has different applications and is generally utilized in electronic and automated Projects.

6.1 Hardware and Software Setup

The equipment execution incorporates the setting of Ultrasonic Sensors, Bluetooth module, microcontrollers, and Projection module. The Projection module utilizes laser light to project the console format utilizing a raised focal point and 3D image of the console. Its brilliance can be controlled for productive execution. Every one of different parts here are as of now set and prepared to utilize. In the wake of turning on the framework, they naturally begin playing out their ideal assignments.

The product arrangement predominantly requires a calculation for character acknowledge The Console Projection Laser extends the format of the console on a level and obscure surface. After this, the Ultrasonic Sensor starts discharging ultrasonic signs. The ultrasonic sensor is essentially a sound sensor, that works at a recurrence higher than the meeting skill of people. These gadgets perform on an idea of reverberation sound, which assesses the qualities of an objective by explaining

the reverberations from sound waves. These sensors decide the distance of an
object by creating high-recurrence sound waves which get reflected by the article as a reverberation and measure the delay between conveying the high-recurrence sound messages and getting the reverberation. For this reason, the accompanying estimations and equations are utilized:

6.2 Proposed Methodology

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Time = Span of Echo movements (microseconds) Distance (centimeters) = Time / 58 Distance (inches) = Time / 148

In the wake of identifying the squeezed key, for deciding the character, Beagle bone Dark Fire up C is utilized. Beagle bone Dark Fire up C goes about as an assessment stage with a blend of programming advancement and microcontroller conditions. The majority of the Beagle bone Dark Fire up C projects are written in Python Programming Language and they can be run altogether working frameworks. After this, the composed person should be shown. To show the person, a screen is utilized and the contribution to be shown is sent through the Bluetooth module. This module permits us to send and get information through remote means. At last, the composed key or the entered characters are shown. The proposed system stream chart is displayed in Fig - 5.

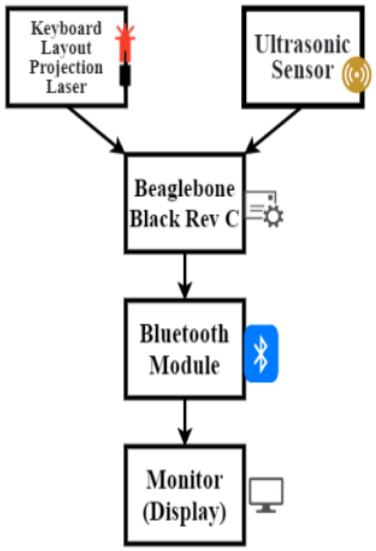

Fig -5: Proposed Methodology Flow Diagram

7. ADVANTAGES

a) Virtual Consoles are convenient and can be conveyed in
pockets. They take little space in sacks or on PC tables.
b) They can lessen the gamble from dull strain wounds.
c) It gives the different elective formats of a console.
d) They accompany an underlying battery-powered battery.
e) It needn't bother with a huge tying space.
f) It very well may be utilized in no or faint lighting, for the most part around evening time.
g) They can be utilized as a virtual mouse, power bank, speaker, or cell stand.
h) They are handheld gadgets, which makes them special furthermore, not quite the same as different consoles.

8. DISADVANTAGES

a) It isn't suggested for clients with quick composing speed.
b) Its exactness is somewhat not exactly standard consoles.
c) There is an absence of feeling of composing to a client.
d) On the off chance that the environmental elements are too brilliant, the console is
not plainly apparent.

9. MODIFICATONS

9.1 Extra Utility Features

a) A speaker is added to the Virtual Console gadget, which supports voice announcing and music playing.
b) It can likewise be utilized as a power bank for developing purposes.
c) They can be implanted with a mouse mode include, which empowers the clients to involve it as a virtual mouse [8].
d) It tends to be utilized as a mobile phone stand which is situated at
the top surface of the console which holds a cell with a solid grasp.

9.2 User Comfort Features

a) Various console designs are accessible with various shapes and sizes of keys. For example, round keystrokes.
b) After a specific time, span of inertia, consoles can switch off all alone to save battery, and this Elementis called Auto Rest mode [9].
c) While composing, clients can encounter different key squeezing sound inputs like typewriter sounds or typical console key-squeezing sounds [10].
d) A few Virtual Consoles concoct worked in battery-powered batteries.

10. CONCLUSION

Laser Projection Virtual Consoles is an equipped development, the thought and innovation utilized behind its planning and working are truly unmistakable. However, it doesn't get a lot victory. It very well may be improved assuming its precision is improved and it is extremely helpful for some clients and for nobody else. In the future, when there is a requirement for limited devices, this console will acquire substantially more significance.

REFERENCES

[1] Prof. R. G. Gupta,RaguruShrikanth Reddy, Nakul Navnit Parmar, "Virtual Keyboard Using Image Processing", International Research Journal of Engineering and Technology (IRJET),Vol. 03, pp. 2009-2013, April 2016. [2] Krutika Jadhav, Fahad Jagirdar, Sayali Mane, Jahangir Shahabadi, "VIRTUAL KEYBOARD AND VIRTUAL MOUSE", International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Vol. 05, pp. 1471-1474, May 2016. [3] Nikhil Koul, Pranav Nawathe, Pranav Tulpule, "Virtual Keyboard", International Journal of Scientific & Engineering Research, Vol. 05, pp. 650-653, April-2014.
[4] Rupali Pandey, Amit Kumar Jha, "Virtual Keyboard", National Conference on Smart Computation and Technology in Conjunction with The Smart City Convergence 2018, Vol. 04, pp. 91-95, March 2018.
[5] Souvik Roy, Ajay Kumar Singh, Aman Mittal, Kunal Thakral, "Virtual Wireless Keyboard System with Coordinate Mapping", International Journal of Advances in Engineering & Technology (IJAET) 2014, Vol. 07, pp. 1003-1008, July 2014.
[6] Shaicy P Shaji, Leo Pius, Maritta Simon P, Tressa Francis,Vishnu Babu K, Vineeth Francis, "Virtual Keyboard", International Journal Of Engineering And Computer Science, Vol. 06, pp. 20797-20800, March 2017.
[7] Toshan Sabni, Jayant K Yavatkare, Divyanand S. Yadav, Prof. Vinit Kakde, "Laser Projection Virtual Keyboard: A Laser and Image Processing based Human-Computer Interaction Device", International Journal of Advanced Research in Computer and Communication Engineering, Vol. 06, pp. 346-348, March 2017.
[8] Vidyut Agarwal, Shivam Mishra, Manoj Nehriya, Rupali Satpute, "Virtual Laser Keyboard", International Conference of Innovative Research in Science and Engineering, Vol. 02, pp. 411-414, March 2016.
[9] Paul D. Varcholik, Joseph J. LaViola, Charles E. Hughes, "Establishing a baseline for text entry for a multi-touch virtual keyboard", International Journal of HumanComputer Studies, Volume 70, pp. 657-652, 2012.
[10] Tushar Naykodi, Abhilash Patil, Kiran Sase, Sitesh Singh, "Reconfigurable Virtual Keyboard based on Image processing", International Journal of Engineering Research & Technology (IJERT), Vol. 03, pp. 1-3, 2015.