ON AIR VIRTUAL KEYBOARD

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ABSTRACT

Computing is now not limited to desktops and laptops, it has found its way into mobile devices like palm tops and even cell phones. Due to the continuous and never stopping advancements in technology and artificial intelligence fields, we were motivated to build something related to the same field working on the similar domain. We came up with a idea of building such a keyboard which is on virtual basis but not a regular virtual one where the keyboard is projected on surface. Instead, we built a keyboard which projects in air and with the use of hand and fingertips action, we can type the letter. Artificial Intelligence is a vast field of exploration and we were a part of daily experiments too by contributing into the Virtual and digital world which is the future.

Keywords: Virtual Keyboard, Hand Segmentation Module, Gesture Recognition, Palm Detection, Get RED Index.

I.   INTRODUCTION

As the interest for registering surroundings develops, new human-PC interfaces are authorized to supply various co-operations among clients and machines. In any case, introduce for some human-to-PC collaborations remains the binomial console/mouse. We tend to are exhibiting here a cutting edge innovation, that will be that the Virtual information gadget. Virtual keyboard is an application that virtualizes equipment console with very surprising formats along these lines allowing user to modify the design in application. E.g. user will pick very surprising dialect for proof reader or pick a specific format for bad habit applications. User will even style his very own design in equipment variant.

Virtual keyboard is the new development in this field. The virtual keyboard innovation makes utilization of camera and picture handling (image processing) procedures empowering client to use it away at any level surface utilizing paper console. Virtual keyboard gives us a chance to make a console in any of the favored dialect on pretty much every current stage. The properties of virtual console being little and simple to utilize application make it a decent answer for content contribution crosswise over various stages.

II.   METHODOLOGY

We have used the libraries and various functions of Python from which our Palm tracking Module and Typing on air with hand gestures was carried out easily and conveniently without any latency or lagging. First, we installed the essential libraries through Python Interpreter which were required for coding of the ON AIR VIRTUAL KEYBOARD. Next, we started building the code and with the technique of trial and error method we were able to build a dummy working module of the given project. Then, after lots of improvements and constantly minimizing the errors, we were finally able to construct the actual code of our project. Finally, for the better look of our project we used various colors insertion and attractive and eye-catching methods for the elegant look of our keyboard.

Palm Tracking Module (PTM)

This method was first to be tested. So, we created a module which would sense the palm, detect it and track the outlines on the fingers with some filled circles as continuity between the bending of the fingers. Also, we created a real time box around the palm which would adjust its dimensions as per the closing and opening of the palm in real-time. And we added a real time working FPS (Frames per second) Display.

Virtual Keyboard Working

After successfully testing the Palm Tracking Module, we started to build the Virtual Keyboard for Computer Machine by the help of Gestures by using Python Language.

Using the PTM as dummy code, we built the Virtual Keyboard using the same Python Language and several packages like OPENCV ZONE, MEDIAPIPE, HAND TRACKING MODULE, PYNPUT, NUMPY AND TIME and we

introduced new parameters in it such as KEYBOARD KEYS, BOX TO DISPLAY TEXTS AND REAL TIME FPS DISPLAY.
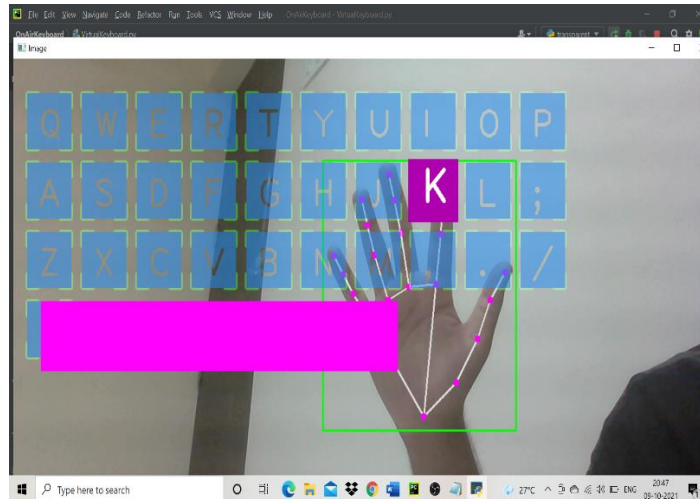
III. MODELING AND ANALYSIS

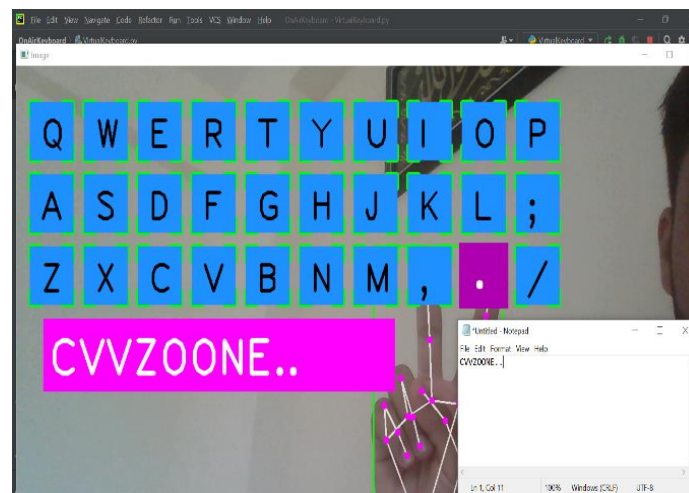**Figure 1:** Virtual Keyboard Display and Hand gesture recognition

Figure 2: Working of Keyboard and generating desired output.

IV. RESULTS AND DISCUSSION

1. Our ON AIR VIRTUAL KEYBOARD is based on working of sensors and actuators.

2. There is no specific need of any kind of knowledge to run this software. It can be easily implemented with the basic idea of rules set to run the program.

3. It is also used in 6th sense technology device in which it is not depends on surface.

4. We are able to access the keyboard layout drawn on a screen aligned and designed for camera window.

5. Further the images are pre-processed before the camera pop up window gets activated which will sharp or blur the image as per the needs of the situation.

6. Then the fingertips of user are detected as soon as there is a contact made with any of the character in the keyboard.

V. CONCLUSION

1. We have successfully built and implemented ON AIR VIRTUAL KEYBOARD based on Artificial Intelligence coded and executed purely on Python platform (PyCharm Community Edition 2021.1.1 x64).

2. Hand gesture recognition module worked smoothly with a minimal latency but we were able to generate our desired output.

3. Artificial Intelligence and Digital World is a vast topic and there is a lot we can explore in it.

4. With the help of sensors, actuators and programming it was possible to bring our hardware keyboard on air and experience something new in the area of computer science and technology with some cool method.

ACKNOWLEDGEMENTS

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