Touchpad and Touch Sensitive Keypad

…using Image Processing

This is my Srishti'14 (annual exhibition of IITR) project.
The scope of this project is to develop an environment that will work as touchpad & touch sensitive keypad for a computer system
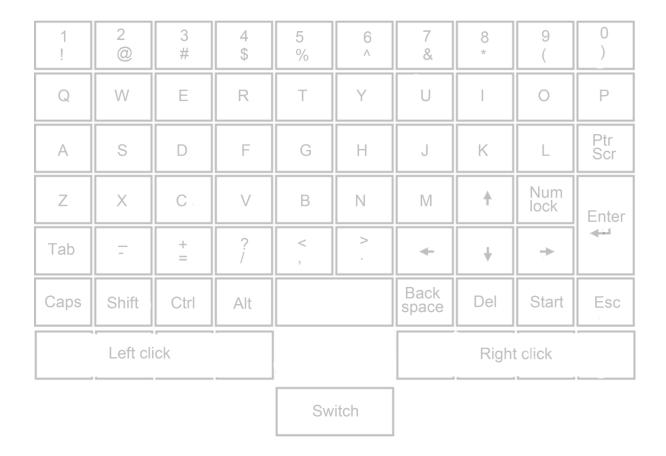
Hardware Components Used – A Normal Camera, Glass plate.

Description & Circuit diagrams - Using the Opencv library in Dev C++, we are processing images continuously as –

1. After capturing a RGB image convert it into HSV format & then detect a particular color. (different threshold for different color & lighting condition) and find the mean pixel coordinate of that color.
2. For keypad –
   If the pixel coordinate of that color is in a particular area then press the corresponding key. I am using *'windows.h'* header file for keyboard & mouse event.
3. For Touchpad –
   I am assigning the change in pixel coordinate of that color in successive image frame to the change in cursor position i.e. absolute mapping, if color moves 'x' in x-direction & 'y' in y-direction then mouse cursor will move 'x' in
   x-direction & 'y' in y-direction or 'n*x', 'n*y' {n Ɛ I⁺}(that depends upon the sensitivity)
4. And the 'Switch' key, used to change mode from touchpad to keypad or keypad to touchpad. When system is in touchpad mode no key will be press only the movement of cursor & left-right click will occur. And visa versa when in keypad mode.

Circuit Diagram – The touch sensitive keypad and touchpad Diagram that is use to implement the algorithm above mention in the Dev C++, is put in Front of Camera.

Switch key to toggle b/w Touchpad & Keypad mode

Applications – The application of this project is to develop an environment that will work as touchpad & touch sensitive keypad for a computer system.

Future Work – The project can be implement by making a small digital camera that can be put in a shirt. Then we can project an image from it on any surface. Now start typing and using touchpad on it. So we are more interacting with physical world then Digital world.

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