Virtual Keypad

PROJECT PROPOSAL

COMPUTER VISION COMPETITION

V-PAD

Project Description:

The project is basically a virtual keypad to provide a seamless and efficient alternative control for any touch screen, provided that, there is a camera. This will significantly help to minimize the spread of viruses and germs residing on commonly used surfaces that is open for the public. As we use touch many surfaces to get some normal day-to-day services, for example using the ATM, buying from a vending machine and ordering food with touch screens at some restaurants. This can also help with the current outbreak of the coronavirus (COVID-19) and maybe lessen the chances of any future outbreaks.

As a prototype for the project, we will mainly focus on implementing an ATM-similar interface using the laptop webcam to prove the applicability of the project's idea. A project that can later be installed on every ATM machine without the need for any additional hardware set up, as all ATM machines come with a preinstalled camera of their own.

Implementation Details:

User Interface:

The project aims to provide a new and revolutionary user interface that is seamless to use while at the same time provides a hygienic standard that was mistakenly overlooked in today's user interfaces.

Technologies used:

The implementation would mainly use image processing technologies like OpenCV library to detect the hand and finger movement, in addition to the gestures of the user. Additional libraries or technologies may be added later to implement the needed functionalities.

Outputs and Inputs:

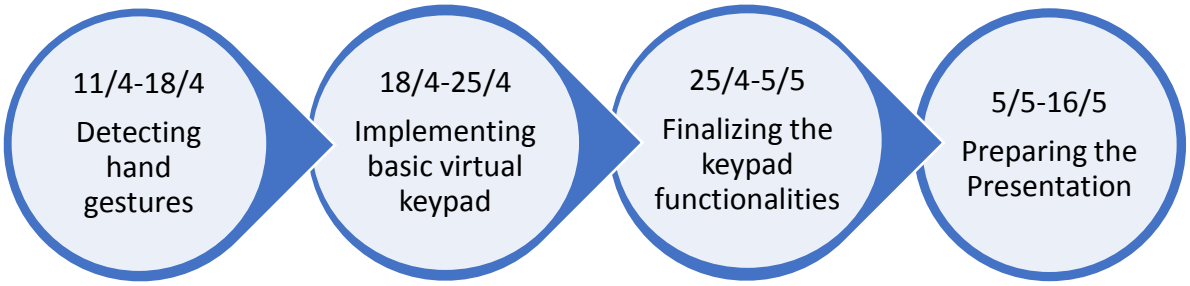
The GUI will output for the user a keypad with the needed functionalities on the screen and a live video of the camera's feed at any time. The user will use his/her hand and finger gestures to interact with the keypad. Specific detected gestures will be considered as inputs for the system.

Implementation Plan:

This project is divided into 2 main stages:

1. Analysing the basic hand gestures like fingers detection and the virtual button pressing action
2. Implementing the virtual keypad design and functionalities

Implementation Timeline:



Improvements and Extensions:

This can be used as a new way of interacting with the electronic devices in general. Just a little gesture of the hand is enough for you to use the virtual keypad and control any smart device.

Team Members:

Mohand Gamal Fawzy Helmy	**ID:** 1501516
Mohned Mohamed Abd El-Hamied	**ID:** 1501519
Yasmeen Mostafa Hassan Elnaggar	**ID:** 1501717
Yasmine Mohamed Mohamed Elsayed	**ID:** 1501714

Member Roles:

In the 1st stage: Mohned and Mohand will be working on the hand detection, while Yasmine and Yasmeen will focus more on how to capture the press of the user in air.

In the 2nd stage: All team members will work together to integrate what they have learned in the 1st stage to implement the needed functionalities of the virtual keypad.

Samples of probable outputs: