

5. Experiments for controlling the presentation:

Description of the Experiment:

After deciding to use the experiment 3 code for the project, Team AD changed the code to control the presentation by the hand motion. The changes in the code is explained in the next section. Using the modified code, the presentation is controlled based on the hand motion.

Explanation of the Code used in the Experiment:

The code used in the previous experiment printed out “left to right movement” or “right to left movement” when the system detected the left to right movement and the right to left movement respectively. In order to control the presentation, the code must press the keyboard when it detects the hand motion. By importing pynput library and importing Key and Controller from pynput.keyboard, it is possible for the code to press the key on the keyboard.

Since Microsoft PowerPoint cannot be installed on Raspberry Pi, Team AD download LibreOffice on Raspberry Pi. LibreOffice Impress is the application that can work like Microsoft PowerPoint on Raspberry Pi. The file format of the presentation slide running on Raspberry Pi is odp. The presentation slides on Raspberry Pi can go forward by pressing the right arrow key and can go backward by pressing the left arrow key.

When the code runs, “keyboard” is assigned as Controller() initially. As the system operates, the system collects the data to detect the hand motion. When the system detected the hand movement, keyboard.press(Key.“x”) is going to be executed to press the appropriate key “x”. After pressing the key, keyboard.release(Key.“x”) is executed to release the pressed key. If keyboard.release is not executed, the key will be pressed all the time. The system wants to press the appropriate key only once when the system detected the hand movement. The shortcut of the key used in the library pynput and pynput.keyboard can be found online.

If the system detected the left to right movement, keyboard.press(Key.right) and keyboard.release(Key.right) are executed to press the right key only once. By pressing the right key only once, the presentation slides move to the next slide only once.

If the system detected the right to left movement, keyboard.press(Key.left) and keyboard.release(Key.left) are executed to press the left key only once. By pressing the left key only once, the presentation slides move to the previous slide only once.

The experiment is conducted to check whether the system can execute the appropriate tasks based on the detected hand motion. Like the previous two experiments, two light sensors, A/D converter, and Raspberry Pi are used. otp file is created in the Raspberry Pi for the experiment. Using the VNC viewer, the python code are opened. Initially, the system starts operating by running the code. Then, the otp file is opened on the monitor window as the full-screen mode. The hand is moved from left to right and right to left over two light sensors. By checking whether the presentation moved forward or backward, Team AD determined whether the system successfully detected the hand motion and executed appropriate tasks.

Result of the experiment:

Demonstration Video shows that the system can detect the hand motion and execute the appropriate tasks. It shows that the presentation slides moved to the next slide by the left to right hand movement while it went to the previous slide by the right to left hand movement. As it was mentioned in the previous experiment, the system cannot detect the hand movement when the hand moves to quickly. To make sure the system to work, the hand must not move to quickly. Also, if the presentation slide does not change after the hand motion, it is important to wait for a few seconds before trying the hand motion once more.

