



EE344 - Electronic System Design Lab

Date : May 20, 2021

Project Report

P3 - Integration of multiple images in order to construct a 360 wide view.

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Objectives :

- The images from multiple cameras need to be integrated to build a complete 360 view.
- This work mainly requires the understanding of Image processing and coding for micro-controller.

Uses :

- Can be used as a parking/reverse cam.
- An effective security surveillance system / CCTV cameras.
- To click 360 street view images for google maps.
- For travelling photography/vlogging.

Equipment Used :

- Raspberry Pi 4 model B 2 gb version.
- USB webcams
- Breadboard with push button switch
- Tripod and platform for cameras.
- SD card for storage of raspberry pi.

Technology used :

- OpenCV for stitching the images together.
- Shell Script(.sh file) to run commands automatically in raspberry pi terminal.
- Used GPIO pins to take input from a push button into the raspberry pi.

Circuit Diagram :

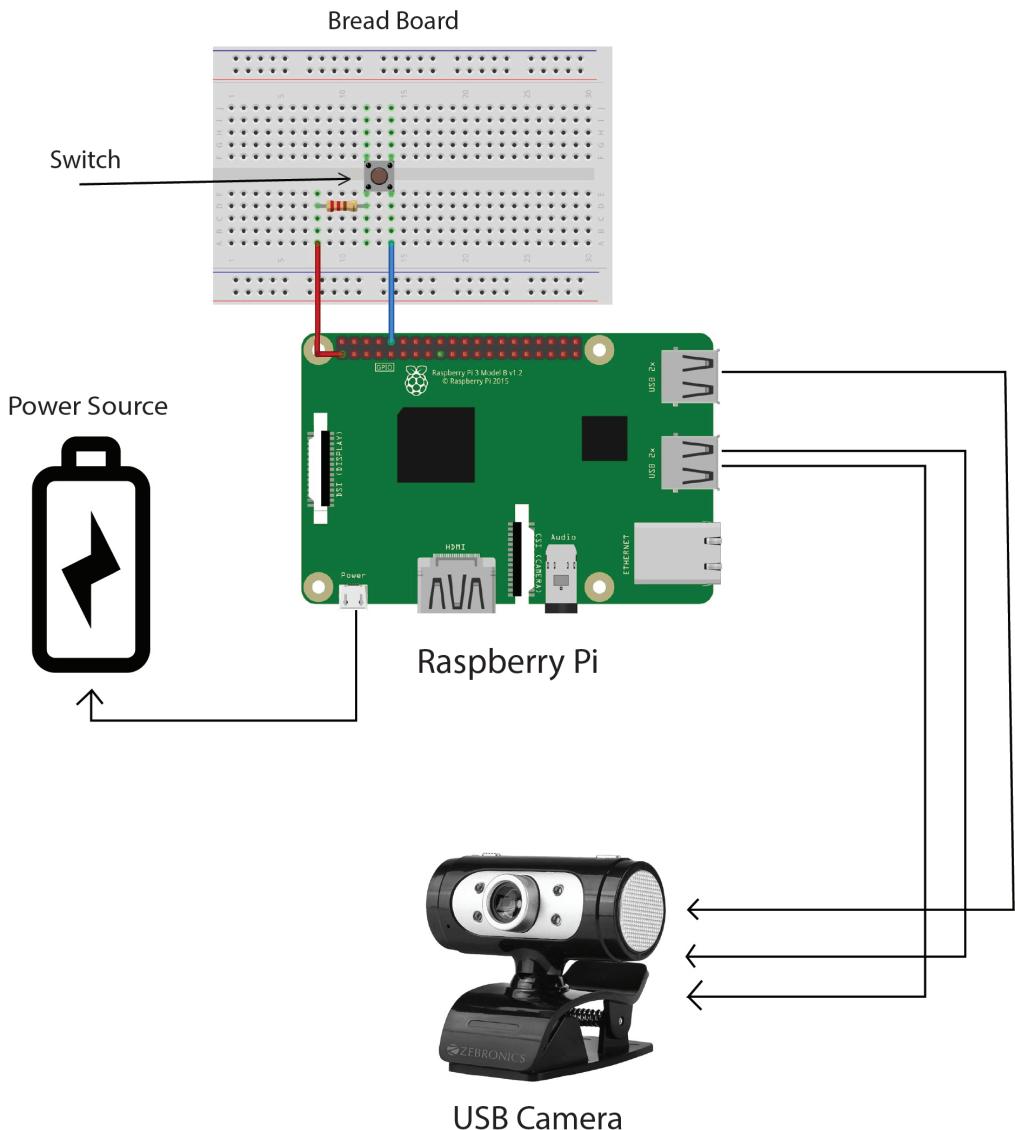


Figure 1: circuit diagram

Procedure :

- We used multiple cameras, each with a 60 degree angle of view physically placed such that they cover a 360 degree viewing angle.
- When the cameras are triggered with a push button that is implemented on a breadboard connected to the GPIO pins of the raspberry pi, the cameras captured multiple images which are then sent to the raspberry pi and stored in a folder (input folder).
- As soon as the images get stored in the input folder, the code to stitch the images together runs automatically.
- The stitching is done using Open CV and IMUTILS libraries. The stitching is performed by firstly identifying the common points/areas among the images and then joining them together by overlapping the common points.
- After the raspberry pi stitches the images, the output image is stored in a separate folder (output folder)

Input Images :



Figure 2: input images

Output Images :



Figure 3: output images

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