Push Button Stop Motion

13016207 COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE

Software Engineering Program

Faculty of Engineering, KMITL

By

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Main Features

This project was developed as a stop-motion camera to take pictures when the button is pressed and create a stop motion video using the photos taken after finished.

Background

I have photography and cinematography as a hobby since high school. I once create stop motion video which take a lot of time because it takes a lot of time for both taking picture and edit. Not to mention that most camera has a limited battery life which result in a race of time before the battery runs out. That is where the Stop-motion camera project was born. Because Raspberry Pi has the ability to be in use as long as a power cable is plugged and automatically edit the video which save a lot of time.

Theory

Number of frames per second

Frame rate, the number of still pictures per unit of time of video, ranges from six or eight frames per second (frame/s) for old mechanical cameras to 120 or more frames per second for new professional cameras. PAL standards (Europe, Asia, Australia, etc.) and SECAM (France, Russia, parts of Africa etc.) specify 25 frame/s, while NTSC standards (USA, Canada, Japan, etc.) specify 29.97 frame/s. Film is shot at the slower frame rate of 24 frames per second, which slightly complicates the process of transferring a cinematic motion picture to video. The minimum frame rate to achieve a comfortable illusion of a moving image is about sixteen frames per second.

Technology

Hardware:	Amount
1. Raspberry Pi 4 Model B	1
2. Jumper Cable Female to Male	2
3. Bread Board	1

List of Input:

1. Button	1
2. Pi Camera	1
3. Keyboard	1

List of Output:

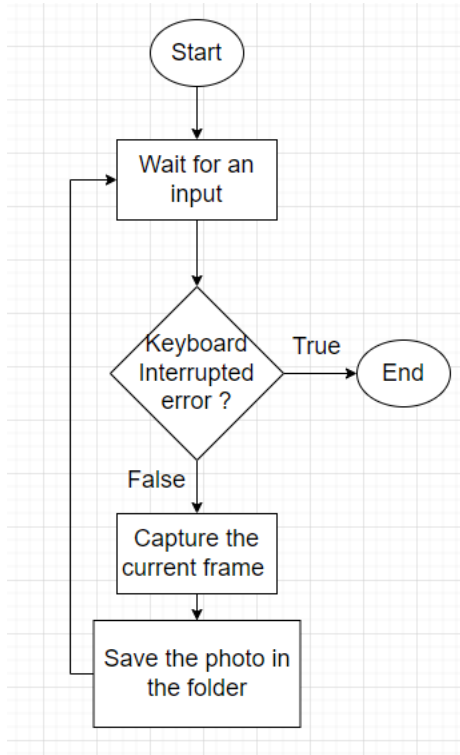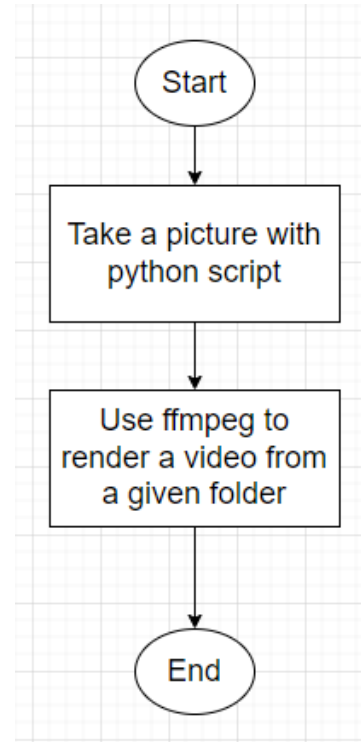|	
1. Any Display	1

Software:

1. Linux (Raspberry Pi OS)
2. Python
   a. pi camera
   b. time
   c. gpiozero
   d. open cv
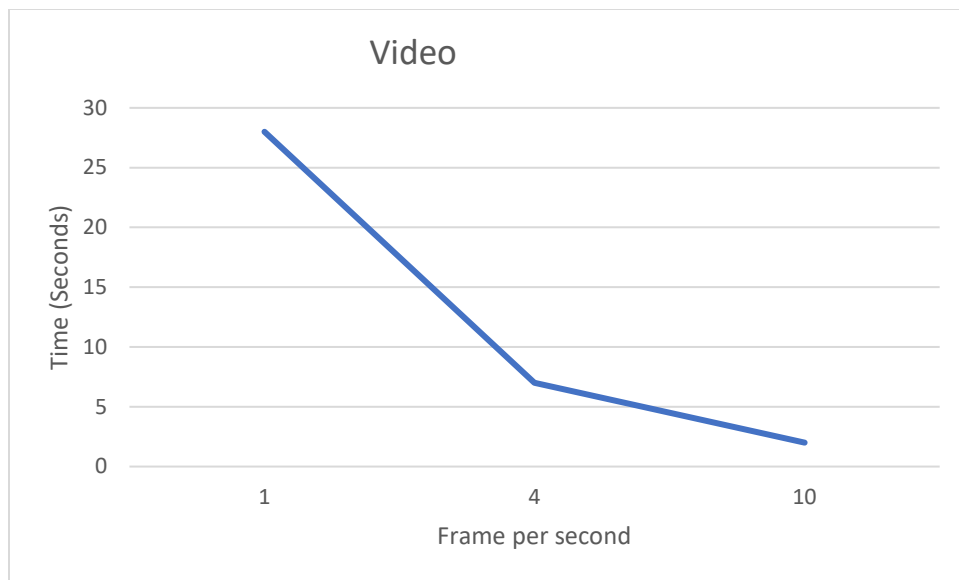   e. os

Main Flowchart

Overall Flowchart

Python Script

Experiment results

Further Development

Pain points

1. Poor Design
2. Camera Preview Bug
3. Not compact
4. Not efficient

Solution

1. Make everything end in the python script
   - Add os command to the python script
2. Remove unnecessary components
   - Remove switch button
3. Fix camera preview bug
   - Use cv2.imgshow() instead of PiCamera.start_preview()

Future

1. Use Raspberry Pi Zero W
2. Use better camera
3. Add a small LCD Display Screen
4. Case to cover all components

How this project related to this course?

1. We use Raspberry Pi as the main component for this project.
2. There are several usages of linux command
3. We create a program to solve the problem.

Conclusion

1. I learn how to implement the knowledge I have learn from this course for solving in real life problems.
2. I learn about the potential and usage of Raspberry Pi
3. I learn how to create program for Raspberry Pi

Source

Theory

https://en.wikipedia.org/wiki/Video

Original Project

https://projects.raspberrypi.org/en/projects/push-button-stop-motion