Raspberry Pi Stop Motion Animation

Created by Mark Webster

Summary:
Learn to make stop motion animated moved with a Raspberry Pi

Introduction

Stop motion animation is the process of taking still images and combining them into a video or movie file. The characters in the movie are objects or models that are moved by hand between each still image. The characters can be dolls, clay objects, or real world people.

A raspberry pi with camera and a push button is the simplest stop motion system. Each push of the button takes another still picture. When done a simple shell script combines the still images into an mp4 video file. The still images can be edited using graphics software, and the video can be edited with video software or with ffmpeg.

Components

Hardware

- Raspberry Pi 3 or better
- Raspberry Pi camera, perhaps with extender cable
- Push button
- Jumper cables
- Supporting structures for the camera

Software

- VLC software (included with default raspbian)
- Ffmpeg (included with default raspbian)
- Python3 (included with default raspbian)
- PiCamera python module (included with default raspbian)
- Gpiozero python module (included with default raspbian)
- Nano editor (included with default raspbian)

In the raspi-config, enable the camera interface.
Make sure the camera ribbon is connected to the pi, and the camera is connected to the support arm.
The push button must be connected to GPIO pins 3 (ground) and GPIO17 pin with jumpers.

The support arm can be made of wood or 3D printed.

Python3 Program

(StopMotion.py)

```
# Takes a picture when a button is pressed. Used for stop motion animation
# Idea from projects.raspberrypi.org/en/projects/push-button-stop-motion/5
# assumes there is a directory /home/pi/Pictures/frames/
# A physical push button is connected between pin 17 and ground
# Control+C terminated program so a keyboard or SSH is required

from picamera import PiCamera
from time import sleep
from gpiozero import Button

button = Button(17)
camera = PiCamera()
camera.vflip = True
camera.hflip = True

camera.start_preview()

frame = 1
while True:
   try:
      button.wait_for_press()
      camera.capture('frame%03d.jpg' % frame)
      frame += 1
   except KeyboardInterrupt:
      camera.stop_preview()
      break
```

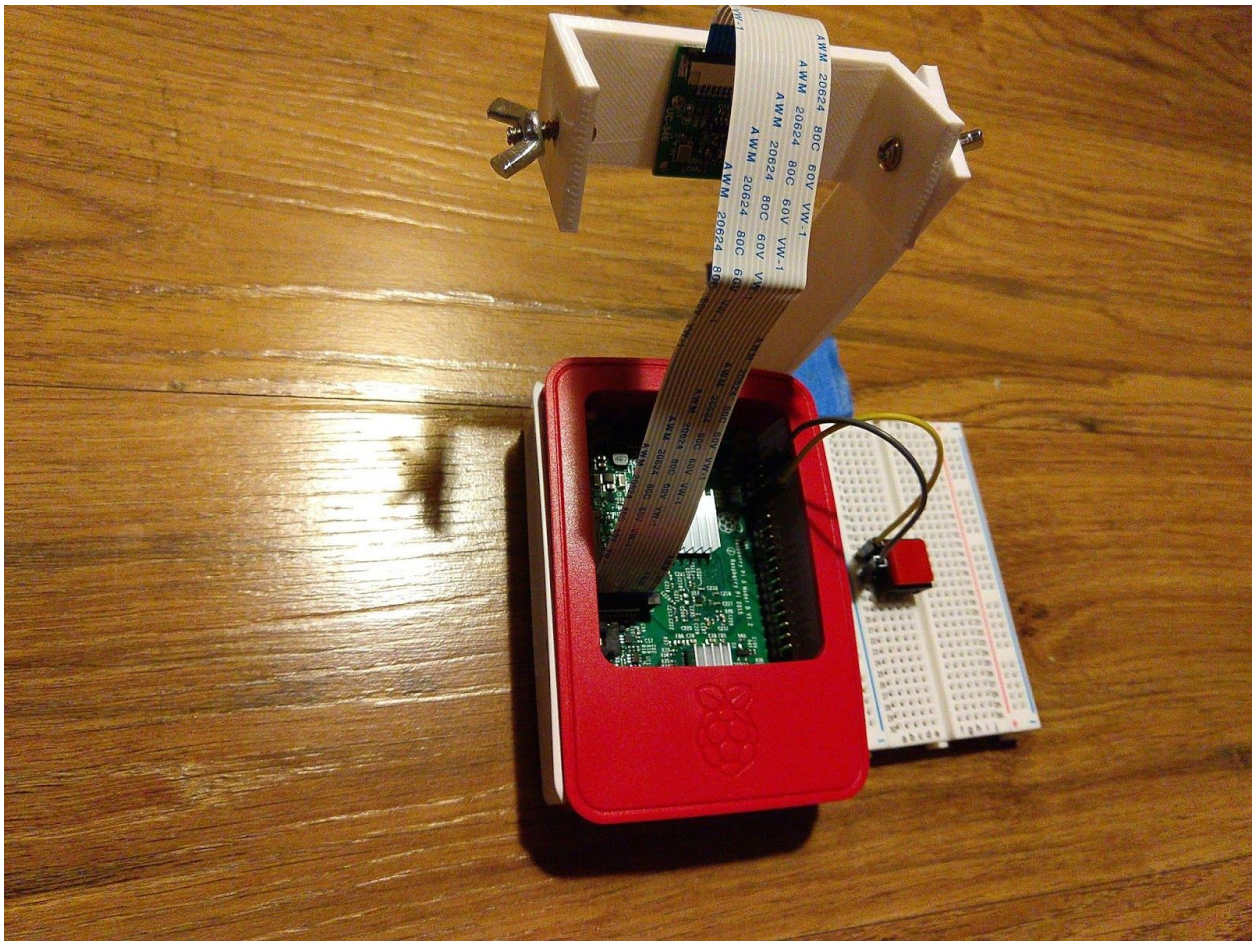
Place this python code in the directory (folder) where the images and videos should end up.
Run at the command line with
“Python3 stop

Script to Combine Images

(Still2Video.sh)

```
#! /bin/bash
ffmpeg -r 10 -f image2 -s 1920x1080 -i frame%03d.jpg -vcodec libx264 -crf 25 -pix_fmt yuv420p
myAnimation.mp4
```

Picture of One Stop Motion Setup



Picture of an official (but still DIY) Raspberry Pi stop motion system for children

Exercises:

Exercise 1: Take a still picture with a Raspberry Pi

Exercise 2: Take a still picture with Python code and a button

Exercise 3: Make a series of still pictures for a stop motion video

Exercise 4: Combine still pictures into a video