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Run GIF in Pygame

OBJECTIVE

Run the GIFs on Full Screen

OVERVIEW

In this experiment, the ROS python code will be created to run the GIFs on the full screen, and also receive a GIF file to run so that the pygame python module can be used.

Pygame

Pygame is an SDL (Simple DirectMedia Layer) library that provides cross-platform access to systems underlying multimedia hardware components, such as video, mouse, keyboard, and joystick.

REQUIREMENT

Software Required

1. VS Code

PROCEDURE

Installation

Install Pygame Module

```
pip3 install pygame
```

Verify installation by loading one example from the library

```
python3 -m pygame.examples.aliens
```

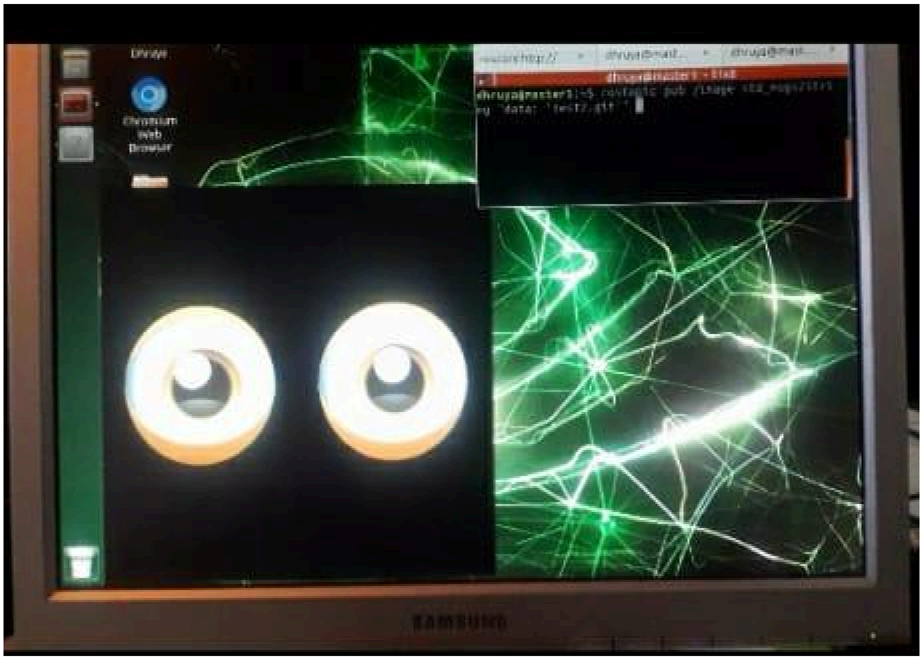
Code

```
#!/usr/bin/env python

import rospy
from std_msgs.msg import String
import cv2
import pygame
pygame.init()

def cv2ImageToSurface(cv2Image):
    size = cv2Image.shape[1::-1]
    format = 'RGBA' if cv2Image.shape[2] == 4 else 'RGB'
    cv2Image[:, :, [0, 2]] = cv2Image[:, :, [2, 0]]
    surface = pygame.image.frombuffer(cv2Image.flatten(), size, format)
    return surface.convert_alpha() if format == 'RGBA' else
surface.convert()

def loadGIF(filename):
    gif = cv2.VideoCapture(filename)
    frames = []
    while True:
        ret, cv2Image = gif.read()
        if not ret:
            break
        pygameImage = cv2ImageToSurface(cv2Image)
        frames.append(pygameImage)
    return frames
window = pygame.display.set_mode((500, 500),  pygame.NOFRAME)
#window = pygame.display.set_mode((0, 0), pygame.FULLSCREEN,
pygame.NOFRAME)
clock = pygame.time.Clock()
# get the default size
x, y = window.get_size()
pygame.mouse.set_visible(0)

global gifFrameList
global currentFrame
currentFrame = 0
gifFrameList =
loadGIF(r"/home/dhruya/catkin_ws/src/jet_bot/scripts/test1.gif")


#surface = pygame.display.set_mode((displayWidth, displayHeight),
pygame.NOFRAME)
#surface = pygame.display.set_mode((0, 0), pygame.FULLSCREEN,
pygame.NOFRAME)


def callback(data):
    global gifFrameList
    rospy.loginfo(data.data)
    #read the image
    gif = "/home/dhruya/catkin_ws/src/jet_bot/scripts/"+data.data
    gifFrameList = loadGIF(gif)
    currentFrame = 0

if __name__ == '__main__':
    rospy.init_node('node_image', anonymous=True)
    rospy.Subscriber("image", String, callback)
    # create a window and set it to the image size
    while True:
        clock.tick(20)

        window.fill(0)
        rect = gifFrameList[currentFrame].get_rect(center = (x/2, y/2))
        window.blit(gifFrameList[currentFrame], rect)
        currentFrame = (currentFrame + 1) % len(gifFrameList)
        pygame.display.flip()

        for event in pygame.event.get():
            if event.type == pygame.QUIT:
                pygame.quit()
            elif event.type == pygame.KEYDOWN:
                if event.key == pygame.K_ESCAPE:
                    pygame.quit()


    rospy.spin()
```

Test

Run the File

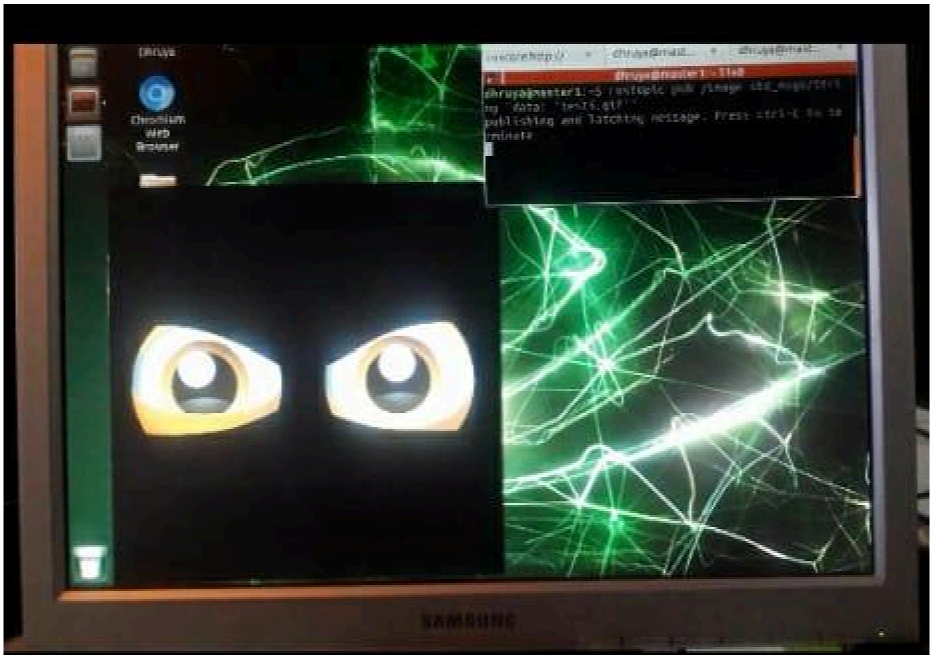
```
rosrun runGIF gif.py
```



```
dhruya@master1:~$ rostopic pub /image std_msgs/Stri
ng 'data: 'test2.gif''
```

Change the GIF by publishing on the FIlename on topic

```
rostopic pub /image std_msgs/String data: 'test2.gif'
```



```
dhruya@master1:~$ rostopic pub /image std_msgs/Stri
ng 'data: 'test1.gif''
publishing and latching message. Press ctrl-C to te
rminate
```

Fullscreen View
(Comment the 27 line and uncomment the 28 line and run the code again)

Problem

The Pygame module does not have any built-in function or method to run GIF directly, but this facility we can get in the Pyglet module. In pyglet module the problem is that we cannot push or change the GIF, if we try to do that it will open a new window, and that we don't need.

Solution

So to run the GIF in pygame we have to use the open cv library, which helps to extract image frames from the GIF and that we will display one by one, which will look like a GIF.

CONCLUSION

No function available to directly run the GIF in pygame, need to process through the cv2 library.

RESULT

Overall performance of this code is good.