



Supplement of

Evaluation of low-cost Raspberry Pi sensors for structure-from-motion reconstructions of glacier calving fronts

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Build components

In this setup, we used:

- Raspberry Pi 4 Model B 1GB RAM
- DFROBOT 3.5" TFT Touchscreen (Optional, to view images in-field)
- Raspberry Pi High Quality Camera Module
- Raspberry Pi 16 mm telephoto lens
- 10 x AA battery holder
- BattBorg Power Board PCB
- Waterproof housing

In order to power a similar Raspberry Pi on a continuous basis (Taylor, 2022), we used:

- Raspberry Pi Zero W
- 12 V Lead Acid Battery
- 10 W Solar Panel
- Solar Charge Controller
- Witty Pi 2 Hat
- Raspberry Pi High Quality Camera Module (with adjusted cable for Zero model)
- Raspberry Pi 16 mm telephoto lens
- Waterproof housing

We have brought WiFi in-field using:

- Peplink HD4 MAX
- Ubiquiti Nanostation

Code for acquisition

The Raspberry Pi was setup with Raspbian OS using NOOBS.

```
#Import relevant modules
from picamera import PiCamera
from time import sleep
from gpiozero import Button
import datetime

#Link the capture button to relevant GPIO pins. Only need for manual
acquisition.
b=Button(26)
pb=Button(16)
off=Button(5)
running = True

#Capture Photo
camera=PiCamera()
camera.resolution=camera.MAX_RESOLUTION
camera.framerate=15

def picture():
    #Filename
    time_now=datetime.datetime.now()
    photo_name=str(0)+'05'+ '-' +str(time_now)[0:10]+'-'
'+str(time_now)[11:19]
    local_file_path='/home/pi/SFM/Boat/'+str(photo_name)+'.jpg'

    print('Capturing photo')
    print(photo_name)
    #Opens a 5-second preview screen to adjust focus if needed
    camera.start_preview(resolution=(1024,768))
    sleep(5)
```

```
    camera.capture(local_file_path)
    camera.stop_preview()
    print(photo_name)
picture

#A second button was used to produce a longer, 30-second preview.
def preview():
    camera.start_preview(resolution=(1024,768))
    sleep(30)
    camera.stop_preview()

#Legacy code from automatic acquisition module which triggered
shutdown upon capture.
def shutdown():
    os.system('sudo shutdown -h now')

b.when_pressed=picture
pb.when_pressed=preview
```