DSO installation

First of all, performed:

```
git clone https://github.com/JakobEngel/dso.git
```

Into Desktop/DSO

2.1: required dependencies: suitesparse and eigen3

```
sudo apt-get install libsuitesparse-dev libeigen3-dev
libboost-all-dev
```

2.2: optional dependencies:

Skipped OpenCV because it comes with ROS installation.

1) Pangoline: https://github.com/stevenlovegrove/Pangolin
   First of all I install **required** dependencies:
   - OpenGL: `sudo apt install libgl1-mesa-dev`
   - `Glew: sudo apt install libglew-dev`
   - `CMake was already installed.`

   Now the **recommended** dependencies:
   - `Python was already installed.`
   - Waylland: already has.

   Optional Dependencies:
   - FFMPEG (For video decoding and image rescaling):
     `sudo apt install ffmpeg libavcodec-dev libavutil-dev libavformat-dev libswscale-dev libavdevice-dev`
   - DC1394 (For firewire input): already installed
   - Libuvc: installed following the steps:

   ```
   git clone https://github.com/libuvc/libuvc
   cd libuvc
   mkdir build
   cd build
   cmake ..
   make && sudo make install
   ```

- libjpeg, libpng, libtiff, libopenexr: all already installed.

Building Pangoline:

First installed sudo apt-get install libxkbcommon-x11-dev

```
git clone https://github.com/stevenlovegrove/Pangolin.git
cd Pangolin
mkdir build
cd build
cmake ..
cmake --build .
```

2) Ziplib:

```
sudo apt-get install zlib1g-dev
cd dso/thirdparty
tar -zxvf libzip-1.1.1.tar.gz
cd libzip-1.1.1/
./configure
make
sudo make install
sudo cp lib/zipconf.h /usr/local/include/zipconf.h
```

2.3: BUILD:

```
cd dso
mkdir build
cd build
cmake ..
make -j4
```

Running DSO_ROS on dataset

I have used the following 2 git repos in order to achieve this task:

1) https://github.com/JakobEngel/dso_ros (Original)
2) https://doc.bwbot.org/zh-cn/books-online/xq-manual-en/topic/599.html (helped me a lot)

I have cloned the catkin branch of link (1) while used the Instructions of Link (2).

First created catkin_ws then I performed git clone github.com/JakobEngel/dso_ros.git -b catkin into catkin_ws/src

(IMPORTANT: I didn't use the Master Branch in the DSO_ROS repo, I used the catkin branch that why I added '-b catkin')

I have encountered an error in the form of "permission denied" when I tried to use some of the ROS commands. In order to fix it I used the following command:

sudo rosdep fix-permissions

I also needed to use source devel/setup.bash in terminal which I eventually added to bashrc in order to prevent using this commands everytime I opened the terminal.

Now in order to test the DSO_ROS, I downloaded one of the Datasets provided in the following link:

https://vision.in.tum.de/data/datasets/mono-dataset?redirect=1

Specifically I used sequence_01.

However, this dataset included images file in the format of jpg, which represented the video. So, in order to use it with DSO_ROS, I was required to convert it to a Bag file:

To convert from images to Bag used BagFromImages from this git:

https://github.com/raulmur/BagFromImages

I simply cloned this repo into catkin_ws/src and followed the instructions in the READ ME file.

but I had to add the following to the CMakeList.txt file in BagFromImages:

find_package(boost COMPONENTS system filesystem REQUIRED)

target_link_libraries(${PROJECT_NAME} ${Boost_FILESYSTEM_LIBRARY} ${Boost_SYSTEM_LIBRARY})

target_link_libraries (${PROJECT_NAME} console_bridge);

Finally, to convert the images folder into video I used the following command,

```
rosrun BagFromImages BagFromImages PATH_TO_IMAGES IMAGE_EXTENSION FREQUENCY
PATH_TO_OUPUT_BAG
```

Once this done, I have run ‘roscore’ command in separate terminal and I run the command:

rosbag play <name of bag file>.bag

and then I run the following command while in catkin_ws:

rosrun dso_ros dso_live image:=/camera/image_raw
calib=/home/yoni4/Desktop/DSO/Dataset/sequence_01/camera.txt
gamma=/home/yoni4/Desktop/DSO/Dataset/sequence_01/pcalib.txt
vignette=/home/yoni4/Desktop/DSO/Dataset/sequence_01/vignette.png