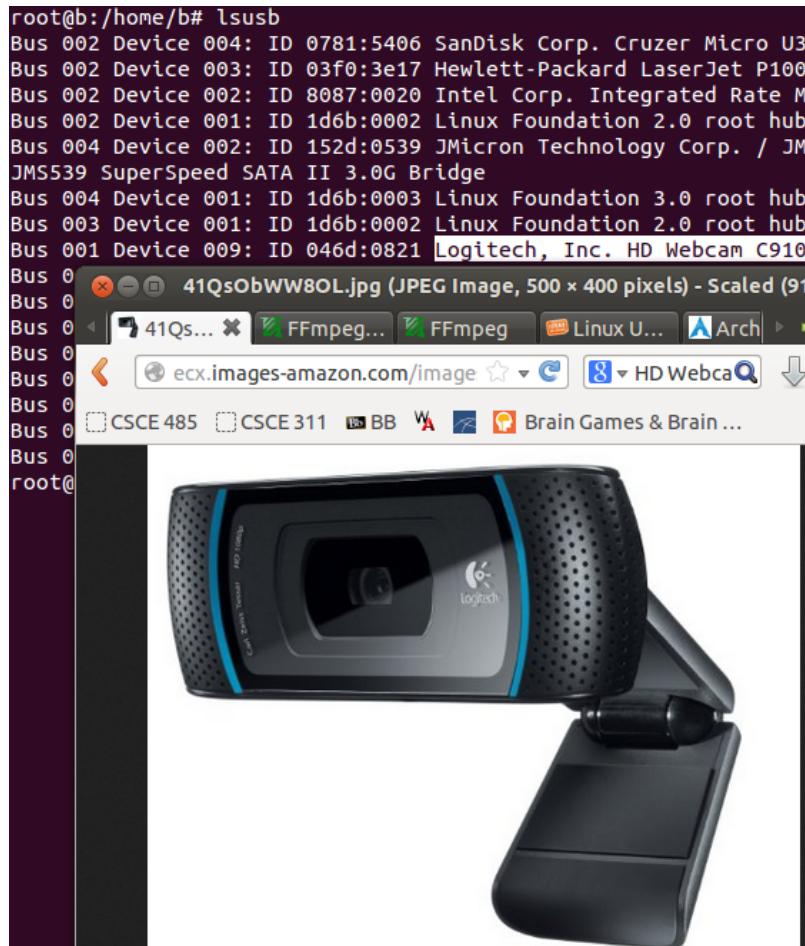


Exercise #2 Familiarity with Linux OpenCV, Camera Interface and Digital Video

ffmpeg install:

```
root@b: /home/b
b@b:~$ sudo su
[sudo] password for b:
root@b:/home/b# sudo apt-get install ffmpeg
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
 libav-tools libavdevice53 libavfilter2
```

My **Logitech C910** is a UVC compatible webcam which I will be using for the following assignments:



ffmpeg camera capture on my chaotic desk (video0 webcam, video1 LogitechC910):

```
root@b:/home/b
root@b:/home/b# ls /dev/video*
/dev/video0  /dev/video1
root@b:/home/b# ffmpeg -f video4linux2 -r 25 -s 640x480 -i /dev/video1 out.avi
ffmpeg version 0.8.9-6:0.8.9-0ubuntu0.13.10.1, Copyright (c) 2000-2013 the Libav developers
ls
root@b:/home/b# vlc out.avi
  and will be removed in a future release.

  time per frame from 1/25 to 1/24
  om bitrate, this may be inaccurate

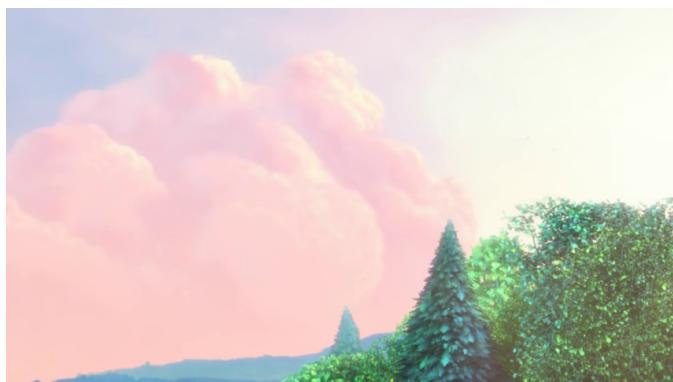
  17964 kb/s
  30, 117964 kb/s, 24 tbr, 1000k tbn, 24 tbc
  epeg4', auto-selecting format 'yuv420p'
  nserted scaler '0' between the filter 'sr
  640 h:480 fmt:yuv420p flags:0x4

00:03 01:02
  50%  [  ]  LAVF153.21.1
Stream #0.0: Video: mpeg4, yuv420p, 640x480, q=2-31, 200 kb/s, 24 tbn, 24 tbc
Stream mapping:
Stream #0.0 -> #0.0
Press ctrl-c to stop encoding
^Cframe= 1503 fps= 24 q=31.0 Lsize=    1952kB time=62.62 bitrate= 255.3kbits/s
video:1910kB audio:0kB global headers:0kB muxing overhead 2.171850%
Received signal 2: terminating.
root@b:/home/b#
```

1)

FAQ settings for encoding movies into single pictures:

```
ffmpeg -i movie.mpg -f image2 -c:v mjpeg menu%d.jpg
```

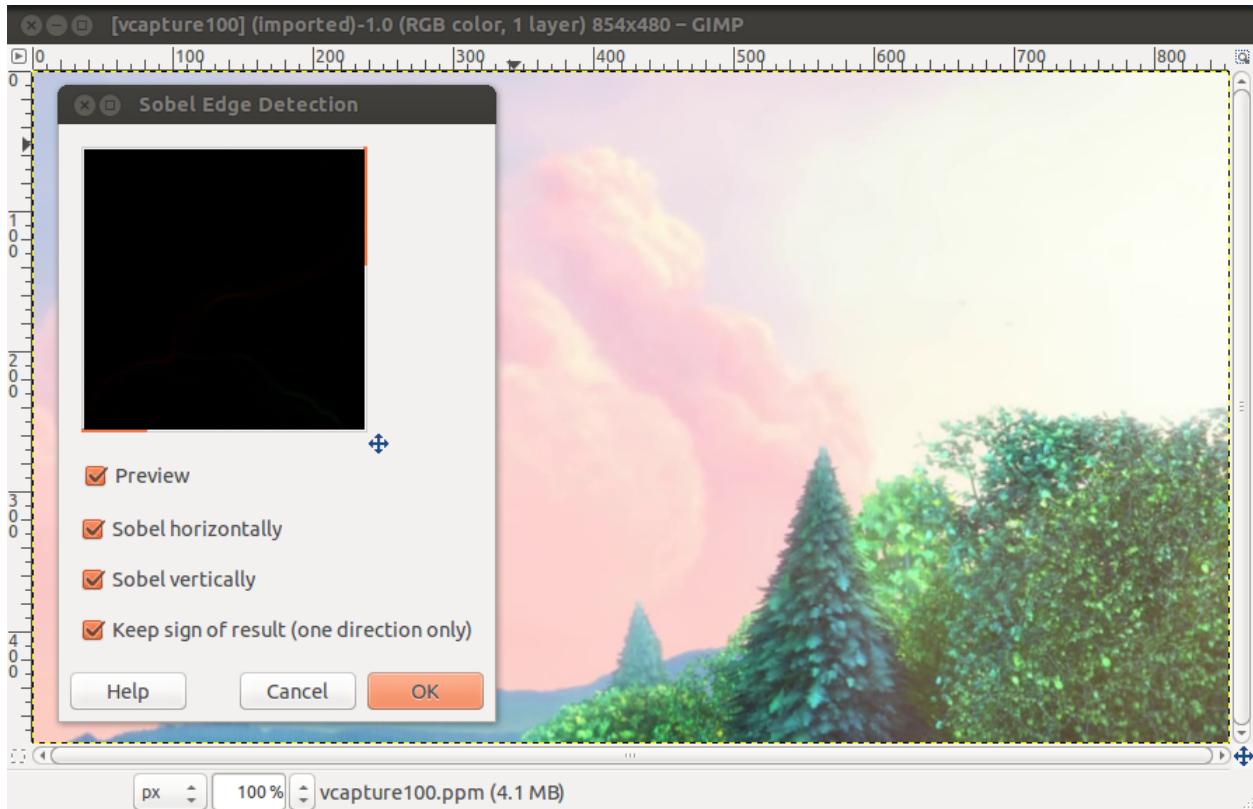


using avconv (ffmpeg) with requested parameters:

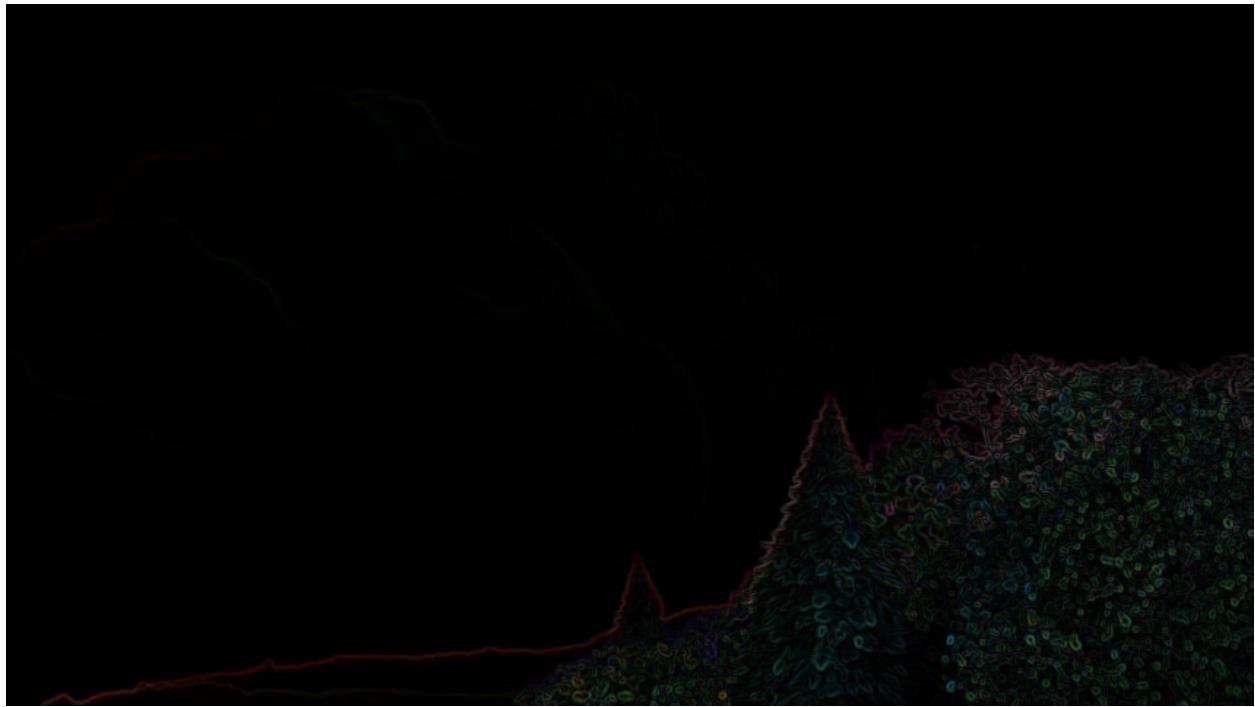
```
root@b:/home/b# avconv -ss 0 -i Desktop/CSCE485/big_buck_bunny_480p_surround-fix.avi -c:v ppm vcapture%d.ppm
avconv version 0.8.9-6:0.8.9-0ubuntu0.13.10.1, Copyright (c) 2000-2013 the Libav developers
  built on Nov  9 2013 19:09:46 with gcc 4.8.1
Input #0, avi, from 'Desktop/CSCE485/big_buck_bunny_480p_surround-fix.avi':
  Duration: 00:09:56.45, start: 0.000000, bitrate: 2957 kb/s
    Stream #0.0: Video: mpeg4 (Simple Profile), yuv420p, 854x480 [PAR 1:1 DAR 427:240], 24 tbr, 24 tbn
    , 24 tbc
    Stream #0.1: Audio: ac3, 48000 Hz, 5.1, s16, 448 kb/s
Incompatible pixel format 'yuv420p' for codec 'ppm', auto-selecting format 'rgb24'
[buffer @ 0xa7c600] w:854 h:480 pixfmt:yuv420p
[avsink @ 0xa7daa0] auto-inserting filter 'auto-inserted scaler 0' between the filter 'src' and the filter 'out'
[scale @ 0xa7a880] w:854 h:480 fmt:yuv420p -> w:854 h:480 fmt:rgb24 flags:0x4
Output #0, image2, to 'vcapture%d.ppm':
  Metadata:
    encoder         : Lavf53.21.1
  Stream #0.0: Video: ppm, rgb24, 854x480 [PAR 1:1 DAR 427:240], q=2-31, 200 kb/s, 90k tbn, 24 tbc
Stream mapping:
  Stream #0:0 -> #0:0 (mpeg4 -> ppm)
Press ctrl-c to stop encoding
^Cframe= 141 fps= 71 q=0.0 Lsize=      -0kB time=5.88 bitrate= -0.0kbits/s
video:169334kB audio:0kB global headers:0kB muxing overhead -100.000013%
Received signal 2: terminating.
root@b:/home/b#
```

2)

Sobel edge transform on GIMP:



100th frame Transformed:



3)

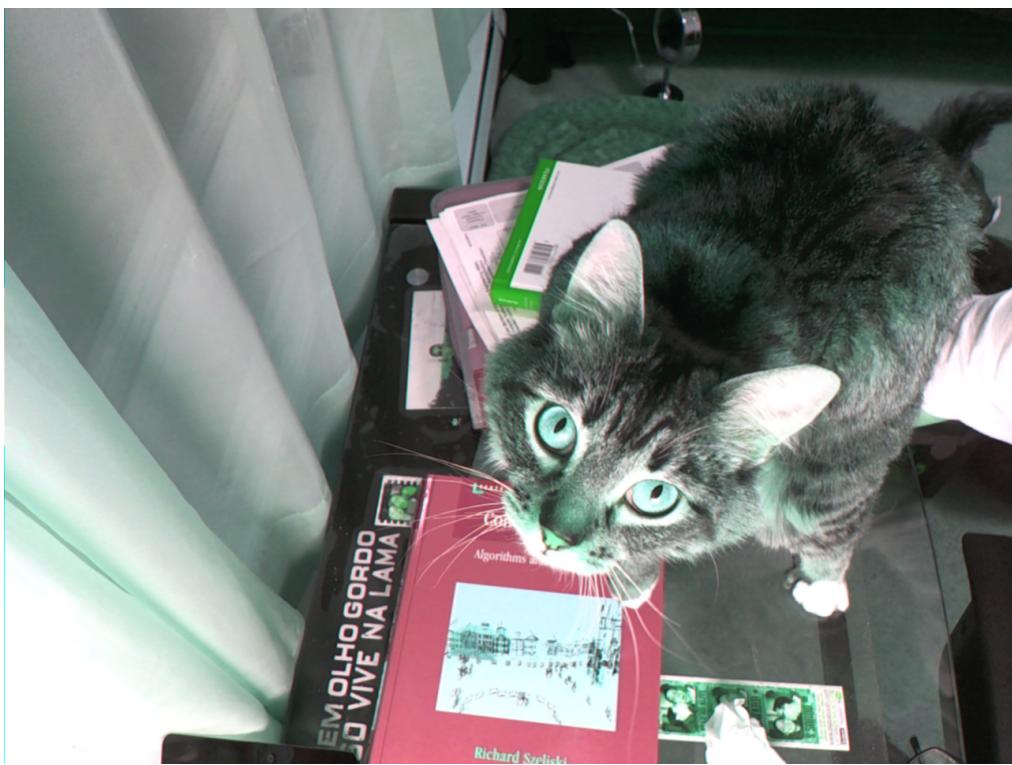
Changing video input for my webcam:

```
993 int main(int argc, char **argv)
994 {
995
996     if(argc > 1)
997         dev_name = argv[1];
998     else
999         dev_name = "/dev/video1"; //changed mine because UVC logitech is attached and
1000                           //video0 is the built in webcam
```

output (canny def):

```
time_error.tv_sec=0, time_error.tv_nsec=0
frame 100: Dump YUYV converted to RGB size 2457
wrote 3686400 bytes
time_error.tv_sec=0, time_error.tv_nsec=0
Total time (s): 21
Total Frame count: 100
Total Frames Per Second: 4.7619
root@b:/home/b/Desktop/CSCE485/LABS/LAB2# █
```

modified code is attached with assignment
(note laptop kept crashing with 1000 frames)



4)

code modified to accommodate an input choice

```
root@b:/home/b/Desktop/CSCE485/LABS/LAB2# ./menucapture  
=====  
Choose between C for Canny or S for Sobel transforms: S  
=====  
FORCING FORMAT  
allocated buffer 0  
allocated buffer 1  
allocated buffer 2  
=====  
time_error.tv_sec=0, time_error.tv_nsec=0  
SOBEL TRANSFORM EXECUTED  
Total time (s): 20  
Total Frame count: 100  
Total Frames Per Second: 5  
root@b:/home/b/Desktop/CSCE485/LABS/LAB2#
```

