

# ECE 438/439

## Lab#1 - Introduction to CVIPlab for C/C++ Programming

1. Download CVIPlab.NET from <https://cviptools.siue.edu/downloads.php>
2. Perform Programming Exercise in Chapter 2: Introduction to CVIPlab
  - i. Review Chapter2 and Online Docs *CVIptools C Functions.pdf* to become familiar with the CVIPlab C functions, and *VisualStudio\_CVIPlab* for using the development environment.
  - ii. Review Section 2.3 and compile the CVIPlab.c and threshold\_lab.c functions.
  - iii. Run CVIPlab, select menu choice 2, threshold, and experiment with various threshold values. Default images are located at “C:\CVIptools\images”

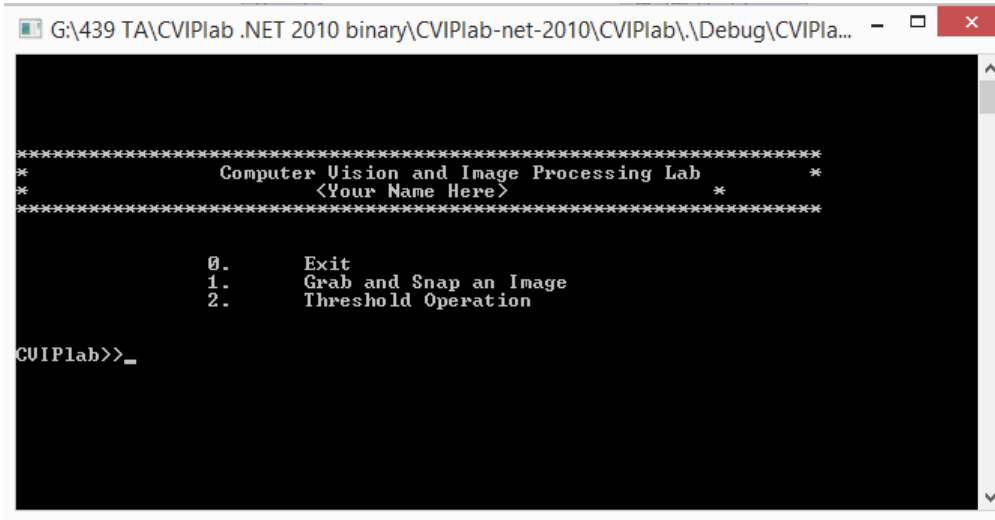


```
*****  
*          Computer Vision and Image Processing Lab          *  
*          <Your Name Here>                                *  
*****  
  
      0.      Exit  
      1.      Grab and Snap an Image  
      2.      Threshold Operation  
  
CVIPlab>>_
```

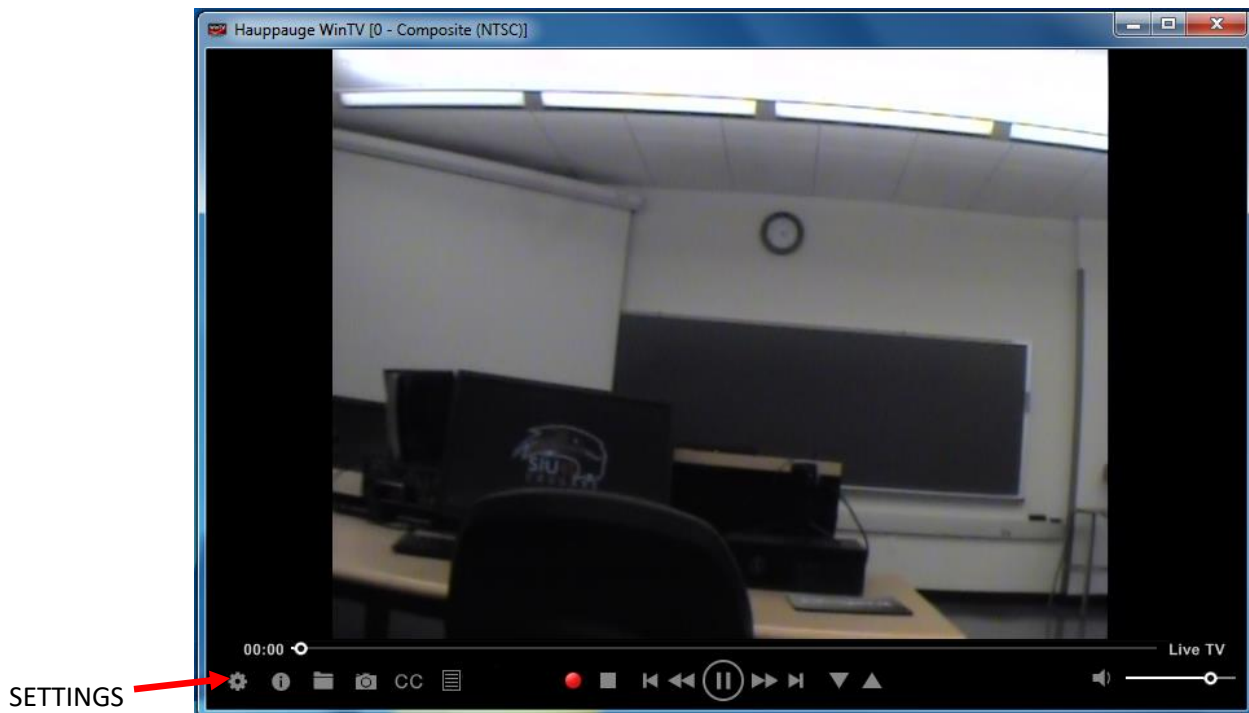
- iv. Edit the CVIPlab.c program to include your **name** and **current date** in the header. Study the CVIPlab.c file and understand how this program is organized and how the threshold function works. In particular, learn how images are read, written and manipulated. The functions for the following programming exercises are to be added to the CVIPlab program.
  - v. Run the CVIptools program. Next open the desired images with the file open icon near the top left of the main window. Select *Utilities*, and then select the *Convert -> Binary Threshold* option. Use this to compare results to your CVIPlab threshold program to verify correctness. You can use the *Utilities -> Compare* option. At the end of this exercise you should understand the CVIPlab environment and be able to write functions by using the threshold function as a prototype.
3. In the CVIPlab.c program, change the line  
`#define VIDEO_APP "explorer.exe"` to

#define VIDEO\_APP "C:\\Program Files (x86)\\WinTV\\WinTV8\\WinTV8.exe" before the function declarations.

4. After making the above changes in the CVIPlab.c program, compile and build the program.

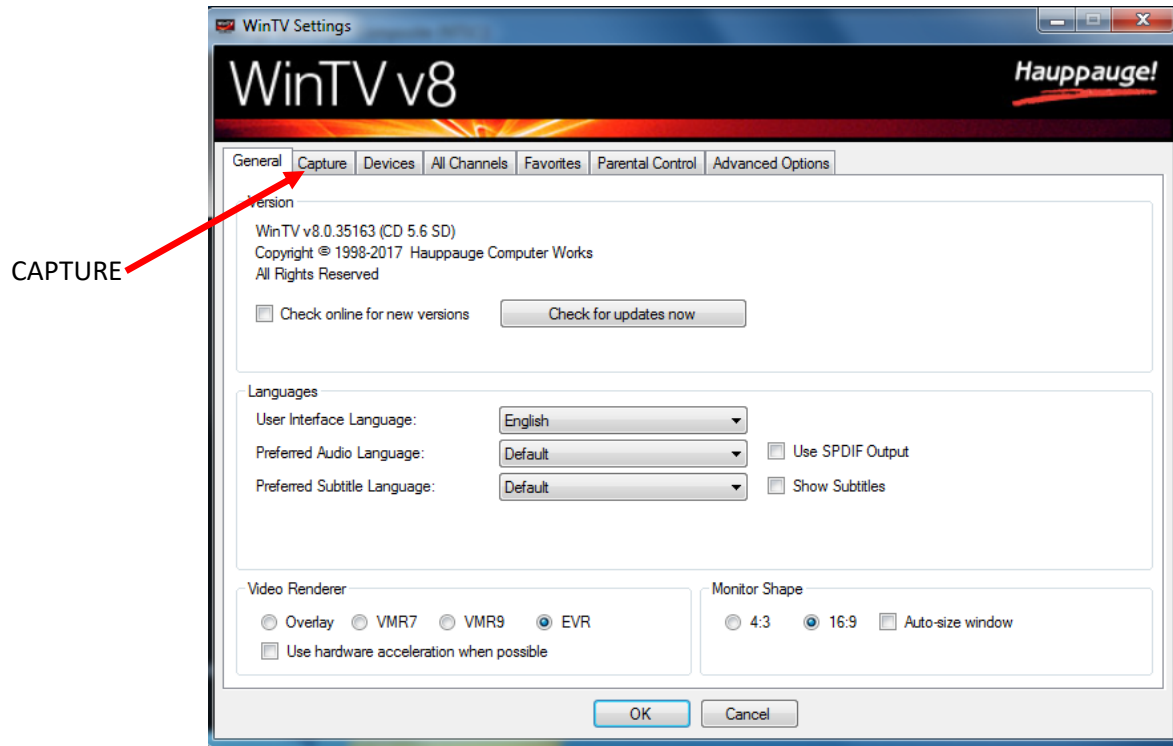


5. Run CVIPlab.c program, select menu choice 1, "Grab and Snap an Image". This will invoke the "WinTV" application.

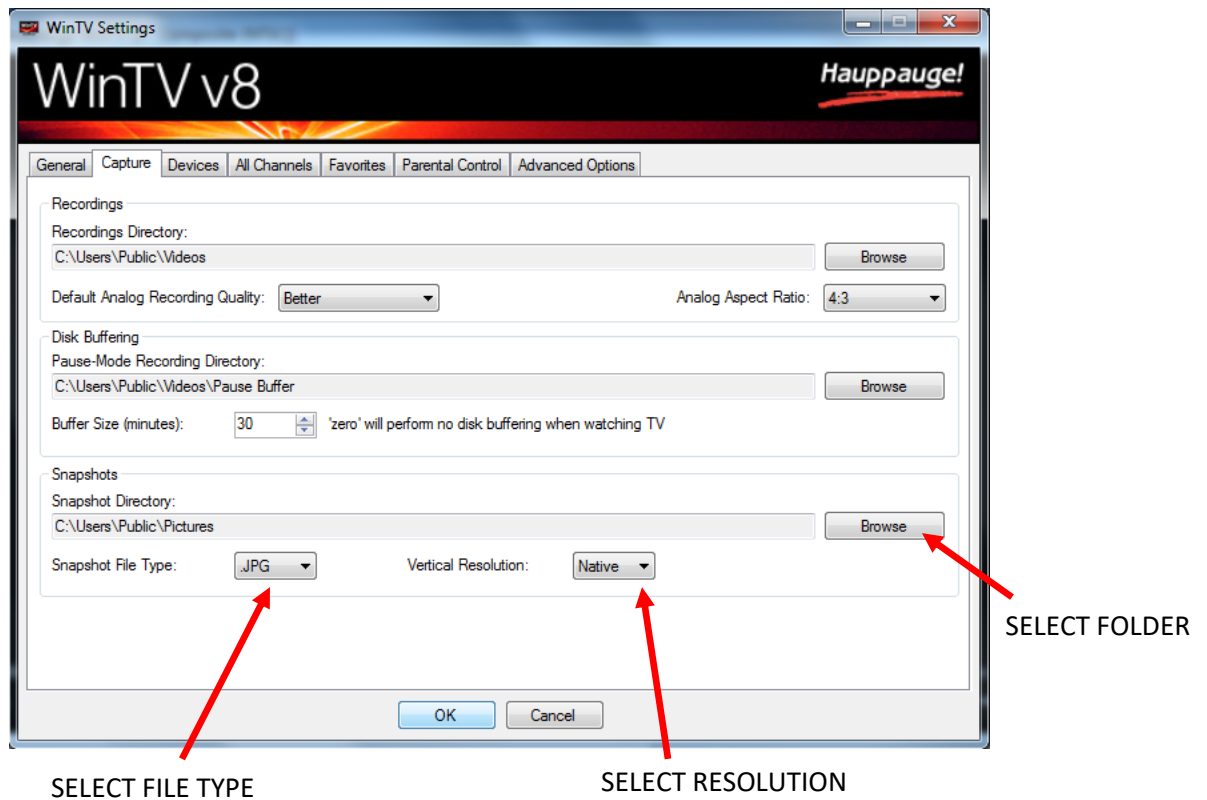


6. An image grabbed by the camera will appear on the WinTV display window, which can be adjusted by moving the camera/object. Also the image can be focused by adjusting the controls on the camera itself if necessary.

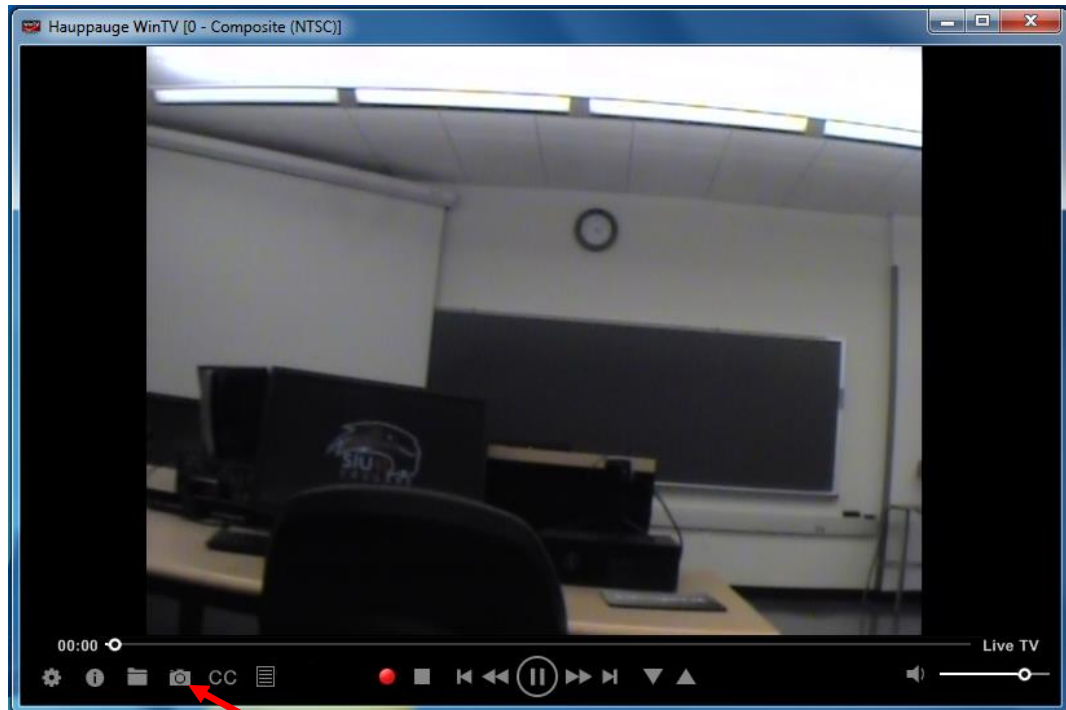
- Click on the “Settings icon” button located on the left side of the window of the WinTV. This will invoke the Video Snapshots Settings window. Then click on Capture icon.



- Select capture resolution, image type, and location of the image to be saved in the *Snapshot Settings*. Click on the “Ok” button to confirm the selection.



9. Click on the “*Snap*” button on the left bottom of the window of the WinTV7 as shown to capture a snapshot/image. The captured image will be saved in the directory provided in the snapshot settings.



SNAP

10. Next, click on the “*CVIPtools icon*” on desktop and view the snapshot/image.
11. Close the WINTV window, the open image dialog will appear. Select the image in the directory provided and it will be displayed into a Matlab Figure.
12. Next, click on the “*CVIPtools icon*” on desktop and view the snapshot/image.
13. Save the image and read it into the GUI-based CVIPtools. Perform the threshold function from the GUI, under *Utilities->Convert->Binary Threshold*. Next, use *Utilities->Compare->Compare Two Images* using both *Subtraction* and *XOR*. Are the results what you expected? Why or why not?
14. Next, use *Utilities->Compare-> Object Error Metrics* using *RMS Error*, *Peak SNR*, *XOR Error*, *Dice*, *Jaccard* and *Overlap*. Are the results what you expected? Why or why not?

## Postlab Report:

- 1) Write a Lab report using the following format, typed, double-spaced using Word:
  - a. Cover page: title, class name, student name, 800 number and date
  - b. Answers to any lab questions
  - c. Screen shoots of your program in action, include images
  - d. Source files (.c or .m files), be sure your code is well commented
- 2) Follow this format for all lab reports
- 3) Email your report to [sumbaug@siue.edu](mailto:sumbaug@siue.edu) on the due date (not before, not after)