

Assignment #7

This assignment is due on May 26th one hour before class via email to <mailto:wallraven@korea.ac.kr>.

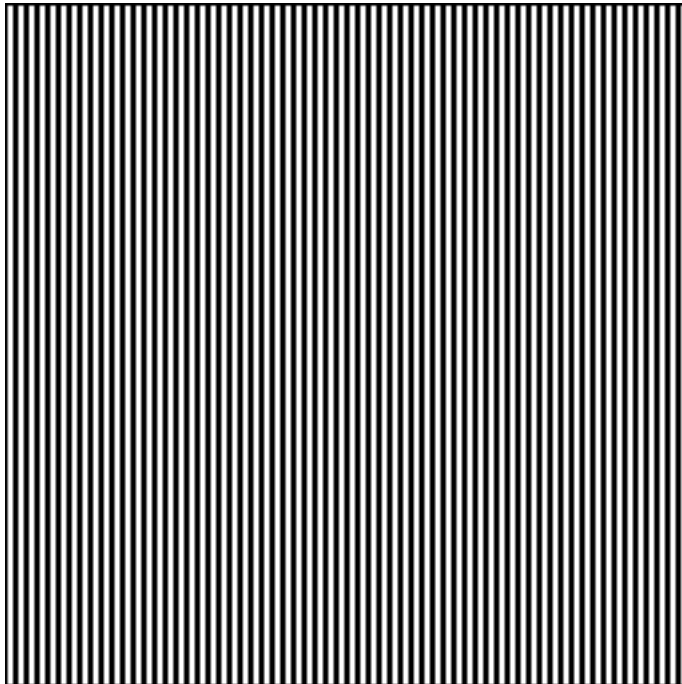
If you are done with the assignment, make one zip-file of the assignment7 directory and call this <LASTNAME_FIRSTNAME_A7.zip> (e.g.: HONG_GILDONG_A7.zip).

Please make sure to comment the code, so that I can understand what it does. Uncommented code will reduce your points!

In this week, you are going to play around with filtering images in Matlab using the Fourier transform. Please go back to the course notes to familiarize yourself with the concepts again.

Part1 (20 points):

The first image we are going to look at is:



Take a screen-shot of this image, save it and include it with your assignment submission.

Write a script called `fourier.m`

Load the image into Matlab.

Insert the commands to display the Fourier spectrum of the image – do NOT log-transform the spectrum. What do you see and how does it relate to the original image? Can I predict the original image from the Fourier spectrum? How? Insert your observations as comments into the script.

Now display the **log-transformed** spectrum. Can you explain why you see this pattern? Insert your observations as comments into the script.

Part2 (40 points):

We are going to re-implement some aspects of filtering based on

<http://forensicphotoshop.blogspot.kr/2008/10/pattern-noise-removal.html>

For more information, also look at

<http://homepages.inf.ed.ac.uk/rbf/HIPR2/fourier.htm>

<http://homepages.inf.ed.ac.uk/rbf/HIPR2/ftdemo.htm>

a) Take a screen-shot of the following image, save it and include it with your assignment submission.



Implement a function with the following specification:

```
function  
maskImageFFT( inputImage, numberOfClicks, filterSize )
```

It should be called with the image file name, load it, display it on screen, and open up a second figure with the Fourier spectrum of that image.

The code then should let the user click with the mouse on the image to mask out a part of the Fourier spectrum with `numberOfClicks` times. Use `ginput`.

The size of the mask is given by `filterSize`. Experiment with circles or rectangles to get the best result.

When the user is finished clicking, the code should do the inverse Fourier transform and display the result in a third figure.

Include code that removes the noise from the clown-image.

b) **Find another image contaminated with REGULAR PATTERN noise** (or create one yourself in Matlab) and include its noisy and filtered versions with your submission. Note, that Gaussian noise or Speckle noise is NOT regular pattern noise!!