Homework 6

CSIS 758

Spring 2017

1 Tachometer

Below is the tachometer image *tach.png*. Your task is to build and FPF that returns peaks for the even numbers but not the odd numbers. You should work in gray scale and not color.

1. Convert the image to gray scale.
2. Manually cut out all of the numbers. Make 9 images with the number cut outs in the center. The frame size of these images should be the same as the frame size of the original image.
3. Create an FPF from these 9 images. Set the constraint vector such that the values are +1 for the images with even digits and -1 for images with the odd digits.
4. Correlate the filter with the original image. If the results are not good the consider a different value of α.

2 Boats

Below is the images *boats2a.png*. Do the following steps.

1. Create a new image with the same frame size as the original image. Manually construct a dock out of simple rectangles as I did in the PDF.
2. Correlate the dock image with the original so that you can determine the best alignment.
3. Align the dock image with the original. Subtract the dock image from the original so that the dock is (mostly) eliminated. You may have to scale the dock image.
4. Manually select several boats. Create and FPF from these cutouts. You choose the value of alpha.
5. Correlate this filter with the boat image. Determine if it did a good job in finding the other boats.
6. You can add new boats to the training set and you can add clutter to the training set for anti-training. Build a new FPF and correlate it with original image.
7. Write a paragraph that explains which boat filter worked better and why.