



ELE 492: Image Processing
Assoc. Prof. Seniha Esen Yuksel
Department of Electrical and Electronics Engineering
Hacettepe University

HW-4

Submission Details: Upload your report as a single .pdf file to the system. Include your code in the appendix of the report. Name it as HW4_yourID_yourName.pdf.

* For this HW, you can work **alone** or in groups of **two**. If you work as a team, **submit a single report** but write your names and IDs clearly in the report. Do not submit multiple copies.

Late Penalty: If you submit late, you will lose 20pts for each day.

* Please remember that you might be chosen randomly to present your work. Be ready to display working code when asked to do so, and be able to describe all your work.

* You can choose Matlab or Python, whichever is more convenient for you.

Object detection: In this homework, you will train a YOLO model to detect the components on a PCB.

Data: <https://www.trust-hub.org/#/data>

Go to the link FICS-PCB: A Multi-Modal Image Dataset For Automated Printed Circuit Board Visual Inspection, and download the data from there.

Select a component of your choice (resistors, capacitors etc.) or you can select to detect all of the components. Use 90% of the labelled components for training and 10% for testing. Try to use YoloV3 when possible.

The data is given as .CSV files. You may need to convert them to other formats for reading into the YOLO structure. A good way is to run a toy YOLO example and to train it for your problem once you get a feel of it.

Report your architecture, any solutions you had to come up with, your assumptions, training and testing results.

If you run into memory issues, you may use Google Colab, decrease the number of images etc. You may look at the following websites, but many more are available:

<https://www.mathworks.com/help/vision/ug/getting-started-with-yolo-v3.html>

<https://www.mathworks.com/help/vision/ug/object-detection-using-yolo-v3-deep-learning.html>

<https://blog.goodaudience.com/part-1-preparing-data-before-training-yolo-v2-and-v3-deepfashion-dataset-3122cd7dd884>

<https://github.com/ElectronicElephant/YOLOv3-mmdetection>

<https://machinelearningmastery.com/how-to-perform-object-detection-with-yolov3-in-keras/>