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# EE 550
# Artificial Neural Networks
# Homework 2

At this project, I implemented the Hopfield model to detect and estimate binary letters using matlab.

Firstly, I created letter images - 10x10 matrices - for letters A, C, K, W and T.  To increase the estimation rate, I tried to minimize correlation among letter patterns. After that, I converted them to vector representations.

Secondly, I calculated weight matrix – 100x100- using these 5 vectors. This part is the training part.

Thirdly, I created a function, called as test, to create noisy letter images and estimate them. This function's parameters are, orderly, original letter matrix, which letter it is, standard deviation to add noise, the number of iterations. This function shows original letter image, noisy image and its binary version, each 5 iterations and binary version.

hopfield.m is the main file and test.m is the test function. If the hopfield.m file is run, it shows the results for the 5 letters with 3 different noises. There are 5 iteration for each test cases.

Also, after hopfield.m is run, any spesific test case can be tested using test.m function at command window.

For example, to test noisy A image with 0.8 standard deviation using 5 iterations:

>>test(A,"A",0.8,weight,5);