Machine Vision **Assignment #3** **Spring 2024**

Correlation: Template matching for object detection

In this assignment, you will implement a simple object detection technique called template matching using correlation.

Given an image and an object template to search for in the image, one simple way is to compute the correlation matrix between the image and the template.

Using the provided text image and the letter ‘e’ template.

1) Convert your images to gray.
2) Compute the correlation of the image and the template. You should get the following (call this result **res**):

Note that there are bright spots in the places where there is an ‘e’ letter in the original image. This means that they are candidate locations for the object.

3) Keep only the values that exceed some threshold value in **res**. You should get a matrix full of zeros except for some values at the locations of the e’s.

4) Write a function BBox that takes the original image, the matrix resulting from previous step, and the template dimensions to draw a bounding box around the detected objects (‘e’)

5) Try your code with the rest of the provided images and templates. Results should be as below.

Note that this is a very simple object detection technique, which needs many enhancements to work in all conditions. The purpose is pure educational.

If you want more details and information about the method and enhancements, refer to the subject "template matching using cross correlation"