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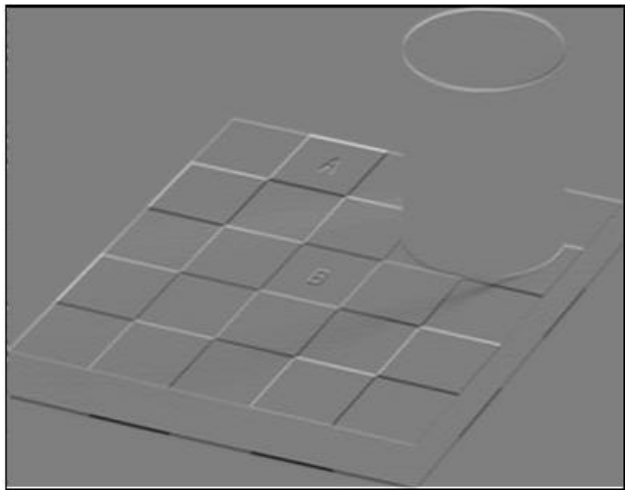
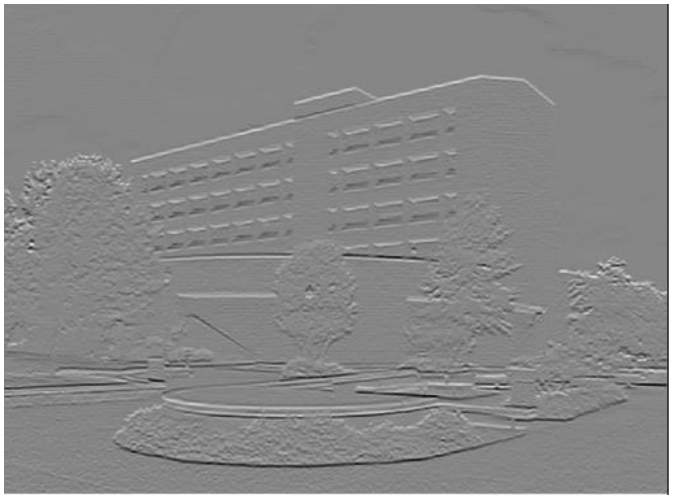
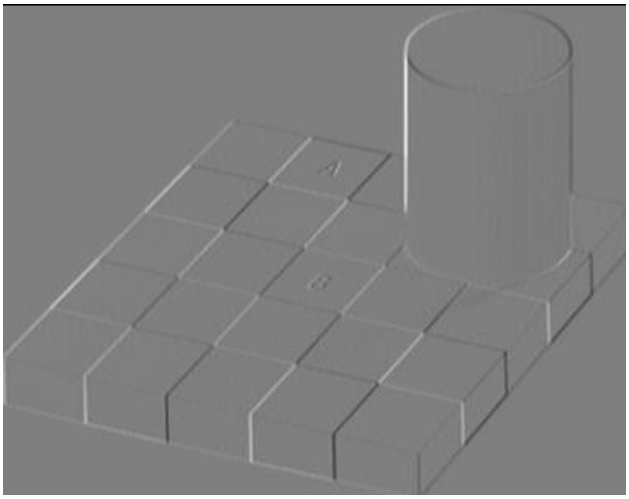
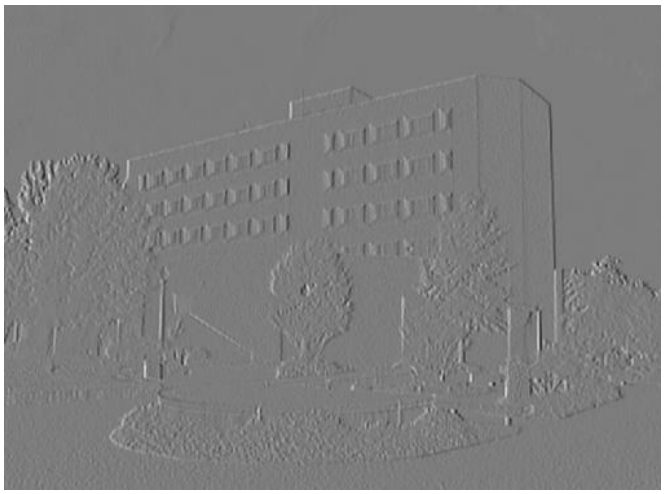
Edge Detection Horizontal:





Edge Detection Vertical:





Edge Detection Code Description:

computeConvolution():
This method handles the convolution of the image and has the option to detect vertical or horizontal edges. It will loop through a selected pixel and get surrounding pixels and multiple that with the Sorbel Template. It will calculate the sum of all of the pixels and return that.

normalize():

This will normalize the image within a range of 0 to 255. It does so by finding the max and min of the image we want to normalize and calculate the correct translation to a value between 0 and 255.

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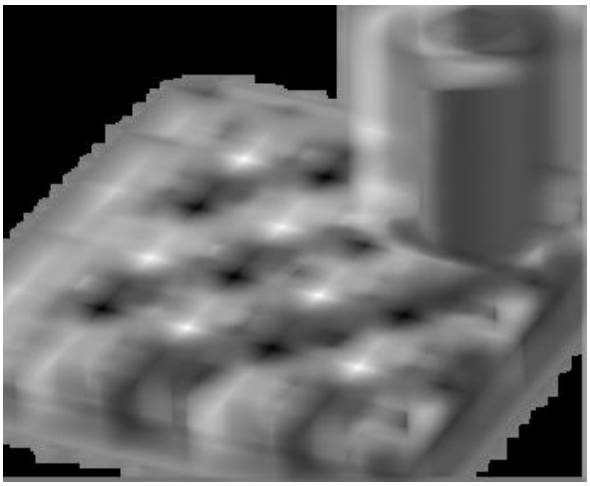
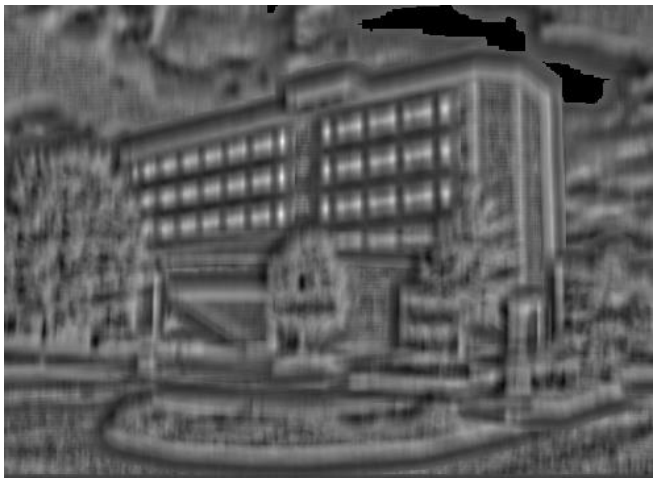
process_image():

This is the main function where everything is called. Here we create a edge_img that will cold the image after it has be convoluted and then we use this same image to create a normalized image that we then assign to proc_img.

Template Matching selected corner on chess board and window on Nedderman:





Template Matching Description:

crossCorrConvolution():
This method handles the convolution of the image. It uses the standard deviation and average of two images (template and a selected section) and performs the convolution on them then returning the sum. It will calculate the sum divided by the total amount of pixels then returns that.

getSection():

This will get a section of the original image using the roi values and return that.

normalize():

This will normalize the image within a range of 0 to 255. It does so by finding the max and min of the image we want to normalize and calculate the correct translation to a value between 0 and 255.

process_image():

This is the main function where everything is called. Here we grab the template image we want to match using roi values. We then loop through all the pixels in the original image to and grab sections of that image. Then compute the cross correlation. Then finally normalize the image.

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average():

This just calculates the average of all the pixels in a given image.

deviation():

This will calculated the standard deviation of all the pixels in a given image.