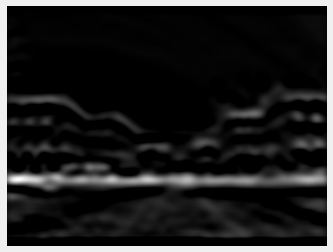
# Project 4 Scene recognition with bag of words

## Q1.1 Extract Filter Responses



Original campus image from the dataset







3 filter responses

I noticed these artifacts: color reversing, blurring, sharpening, horizontal and vertical edge extraction.

CIE Lab color space expresses color using L (lightness), a (from green, negative to red, positive) and b (from blue, negative to yellow, positive). Lab color space is a better approximation to human vision than RGB.

## Q1.2 Collect sample of points from image



Random points on campus image

A picture containing sky, outdoor, ground, grass

Description automatically generated

A picture containing indoor, wall

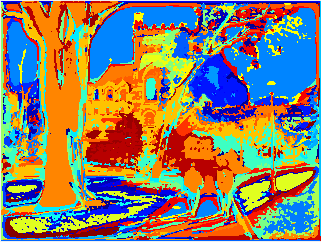
Description automatically generated

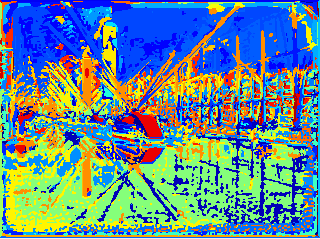
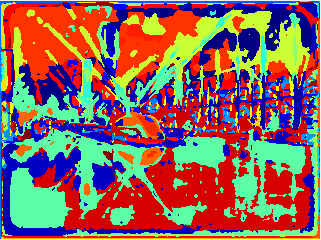
A picture containing indoor, table, floor, wall

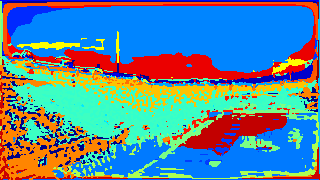
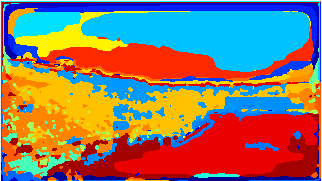
Description automatically generated

The results of the corner detector on 3 different images

## Q2.1 Convert image to word map







Original Image(left), Word map using Random Dict(middle), Word map using Harris Dict(right)

As we can see from the images above, these two visual words does capture the semantic meanings. The Harris dictionary seems better than Random dictionary, because Harris dictionary can clearly show the differences in the details in the picture, but the Random dictionary can only capture the obvious different parts of the images.