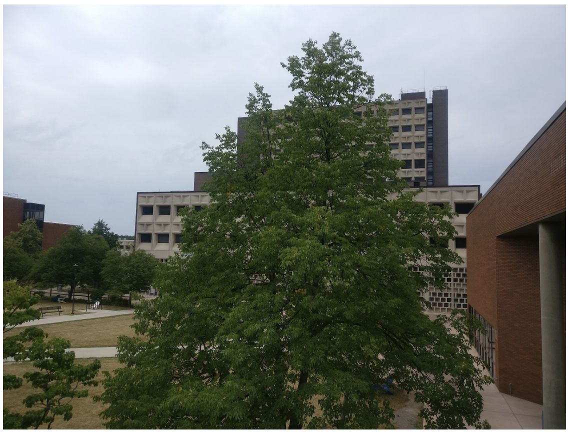
Programming Assignment 3

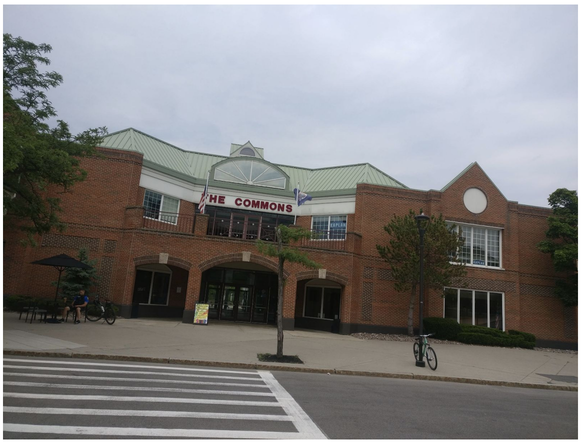
Overall accuracy = 84%

Query images:

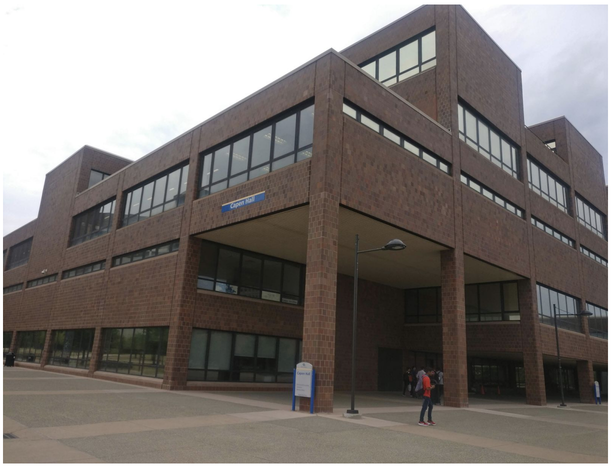
Bell hall



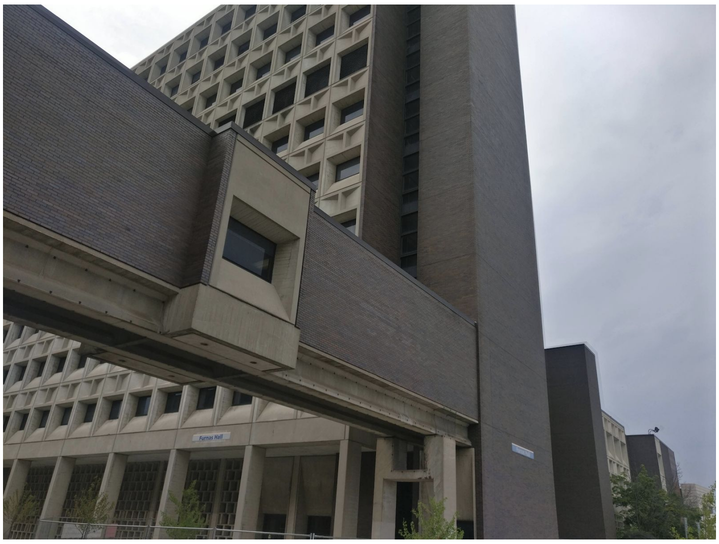
Commons



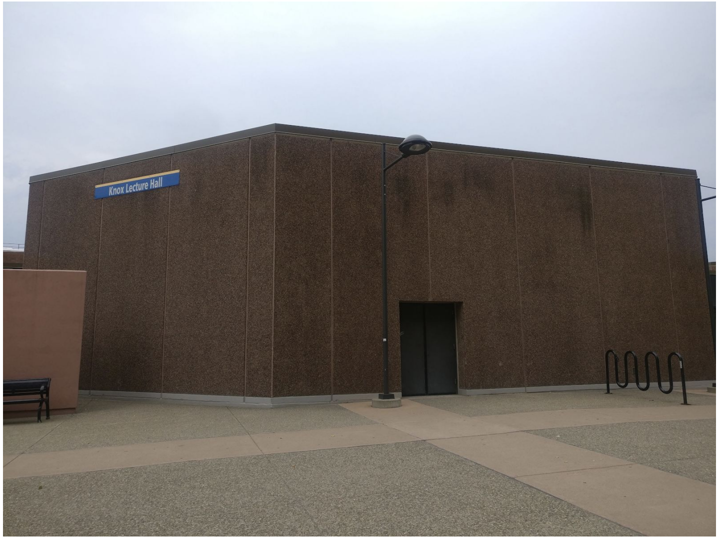
Capen



furnas:

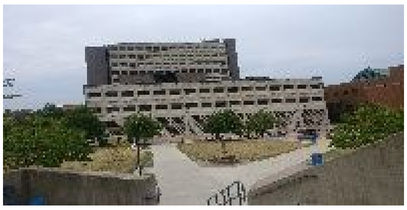


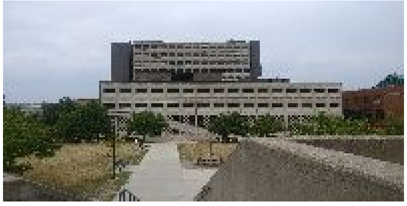
Knox:



Dataset:

Bell hall:

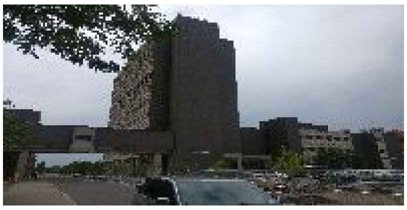




Capen:

Commons:

Furnas:



Knox:

Bell6
Accuracy= 100%
Correct classification=5/5

1. bell5.jpg : 0.303
2. bell3.jpg : 0.667
3. bell4.jpg : 0.699
4. bell2.jpg : 0.782
5. bell1.jpg : 0.796
6. knox5.jpg : 1.019
7. capen4.jpg : 1.044
8. commons5.jpg : 1.048
9. commons3.jpg : 1.066
10. knox4.jpg : 1.085

Commons6
Accuracy= 60%
Correct classification=3/5

1. commons5.jpg : 0.326
2. commons4.jpg : 0.470
3. bell2.jpg : 0.527
4. commons3.jpg : 0.539
5. bell1.jpg : 0.562
6. bell4.jpg : 0.568
7. bell3.jpg : 0.623
8. knox4.jpg : 0.677
9. commons2.jpg : 0.712
10. capen4.jpg : 0.722

Furnas6.jpg
Accuracy= 100%
Correct classification=5/5

1. furnas5.jpg : 0.075
2. furnas4.jpg : 0.355
3. furnas2.jpg : 0.402
4. furnas1.jpg : 0.585
5. furnas3.jpg : 0.630
6. capen3.jpg : 0.640
7. capen4.jpg : 0.740
8. capen5.jpg : 0.758
9. commons3.jpg : 0.802
10. commons5.jpg : 0.948

Capen6.png
Accuracy= 80%
Correct classification=4/5

1. capen3.jpg : 0.240
2. capen2.jpg : 0.336
3. capen1.jpg : 0.564
4. furnas5.jpg : 0.716
5. capen4.jpg : 0.748
6. capen5.jpg : 0.869
7. furnas4.jpg : 0.982
8. knox5.jpg : 0.983
9. furnas2.jpg : 1.035
10. knox4.jpg : 1.060

Knox6.jpg
Accuracy= 80%
Correct classification=4/5

1. knox3.jpg : 0.185
2. knox5.jpg : 0.185
3. knox2.jpg : 0.320
4. knox4.jpg : 0.320
5. bell3.jpg : 0.552
6. capen3.jpg : 0.635
7. capen4.jpg : 0.669
8. bell2.jpg : 0.772
9. capen5.jpg : 0.780
10. bell1.jpg : 0.783

Code being modular is amazing because individual modules can be changed and tested in order to improve its efficiency and performance.Indexing, which is collecting features from the dataset images is based on histogram and similarity was determined based on chi-squared distance. Instead of hard coding the image size values, the author could have just declared the dimensions as global variables or asked the user to pass it as arguments which would enable the user to change the dimensions of the image in 1 step. Also, collecting only color histogram details to calculate feature vector is not ideal because it wouldn’t capture shape,texture,size and other details.SIFT could have been adopted to make sure that one image has exactly same features as resized version of the image.Otherwise, the code is well structured and doesn’t need any refactoring because there are no variables declared that aren’t being used and there was no unnecessary memory allocation. Classes and methods being private made the code more secure and less susceptible to errors or being modified by other classes by mistake. The code is reasonably accurate for the images of similar luminance and perspective. But for long shot images and for images with occlusion, it isn’t accurate because the code considers the pixels from occlusion objects while calculating features and looks for similar features in data set.

This assignment makes students think about object detection and delve deeper.