

# Computer Vision Assignment Report

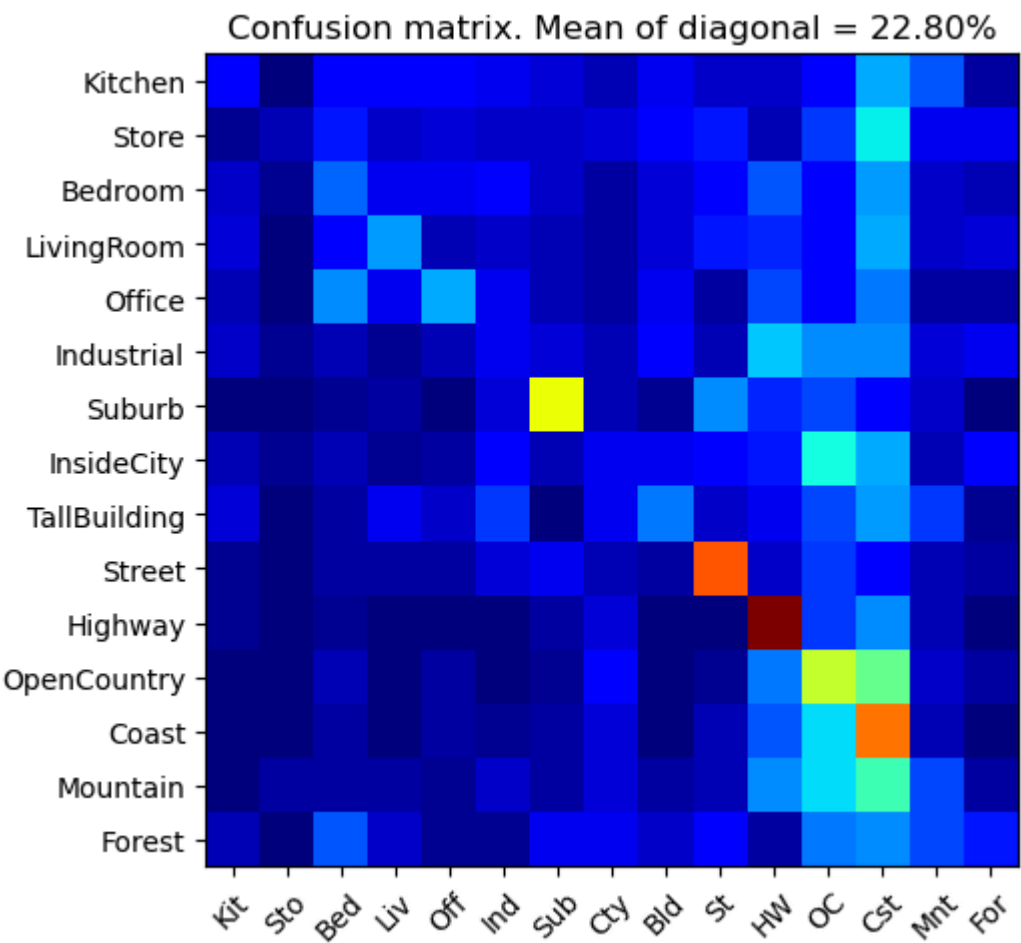
Title: Assignment3

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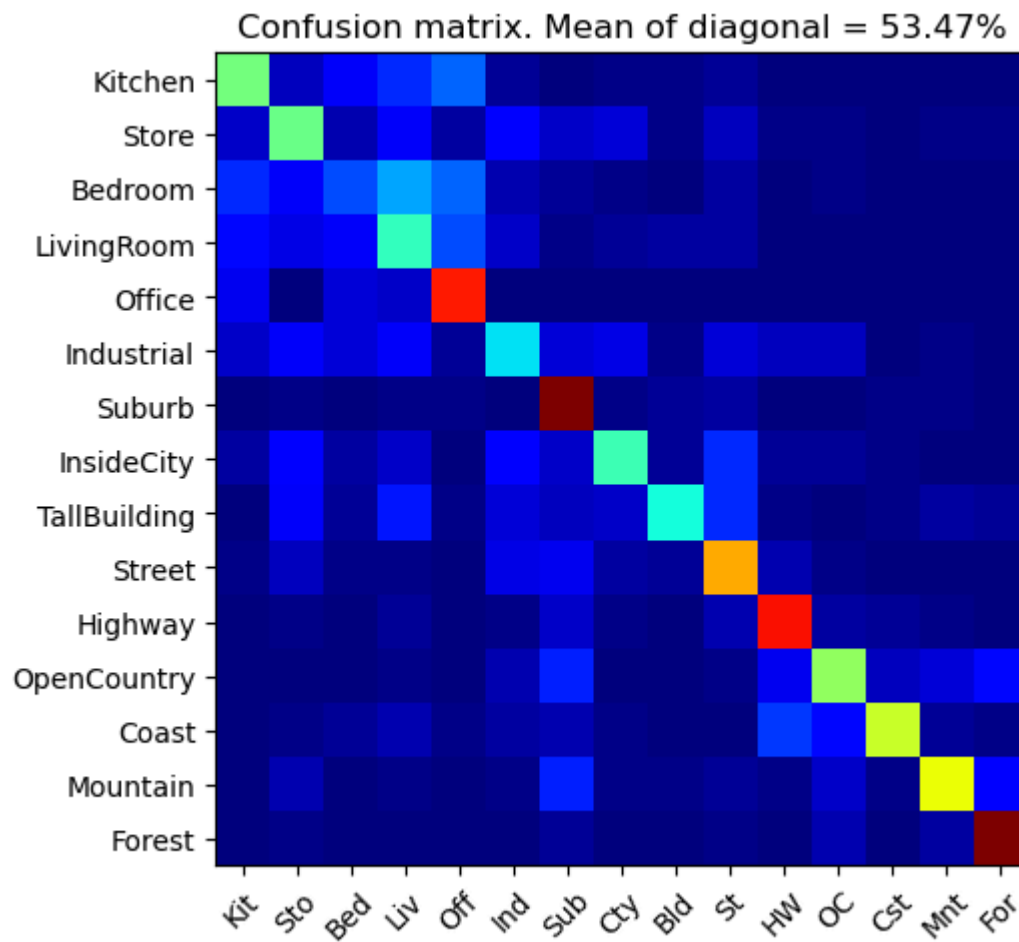
## Experiment 1: The three scene recognition methods

### 1.1 Tiny Image + Nearest Neighbor



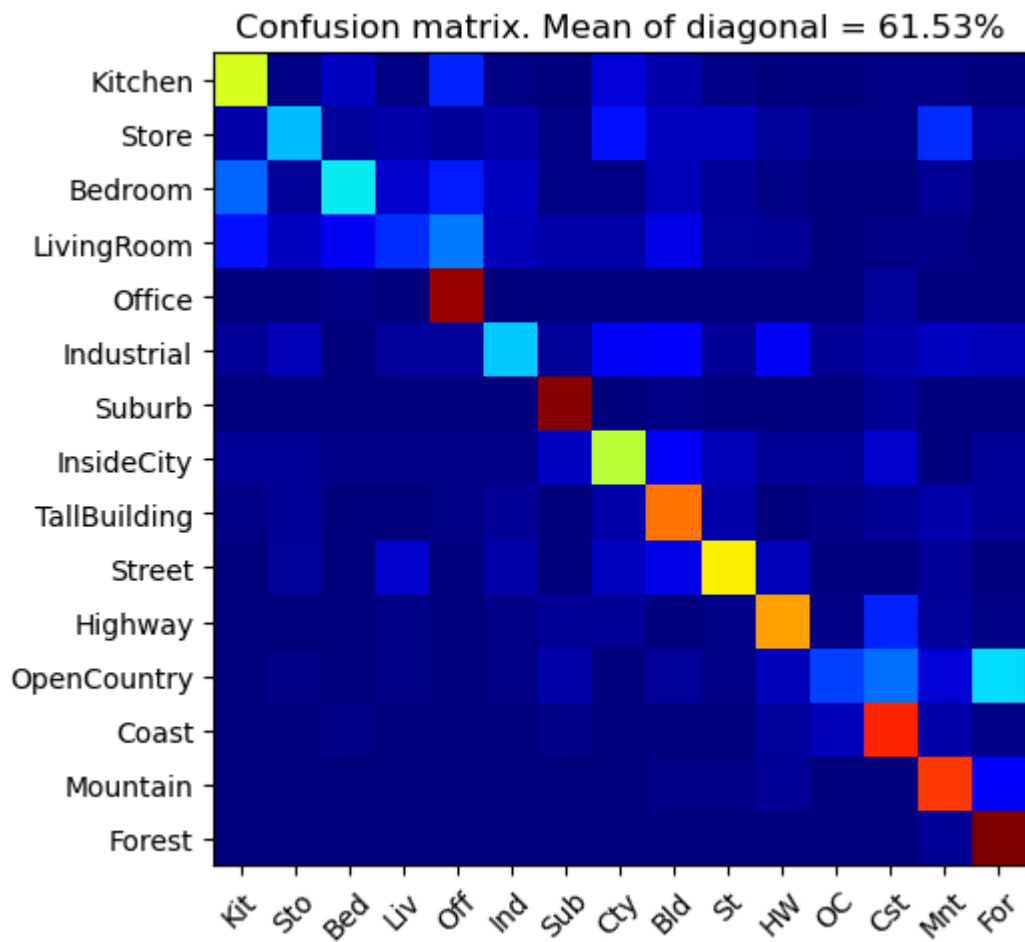
### 1.2 Bag of SIFT + Nearest Neighbor

vocab size = 200



### 1.3 Bag of SIFT + Linear SVM

vocab size = 200



## Experiment 2: Differ Vocab Size

Vocab Size	Bag of SIFT + Nearest Neighbor	Bag of SIFT + Linear SVM
10	44.07%	38.53%
50	50.93%	54.07%
100	53.07%	57.33%
200	55.40%	59.07%
1000	53.53%	65.07%

## Experiment 3: 1-NN vs K-NN

K	Tiny Image + Nearest Neighbor	Bag of SIFT + Nearest Neighbor
1	22.93%	50.93%
3	24.00%	65.07%
5	23.60%	52.67%
7	22.27%	53.20%

## Fast SIFT Experiment

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For the cv2 library, it supports the fast sift algorithm, which is used when using the parameter 'fast' in the sift function.

```
frames, descriptors = vlfeat.sift.dsift(img_single,  
                                       step=sift_step_size,  
                                       fast=sift_fast_mode)
```

On vocab size = 10, if not using the fast sift:

- Vocab Build: 145.65s
- Bos feature extraction: 143.88s

If using the fast sift:

- Vocab Build: 18.04s
- Bos feature extraction: 15.16