

Computer Vision VU

Exercise Course: Assignments II

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Assignment 4: Image Stitching

TODO

Assignment 5: Scene Recognition with Bag of Visual Words

First let's have a short look of how this classification method works: **TODO**

- build a vocabulary of words: ...
- build training set: ...
- classify: ...

To measure the quality of this method, we use a confusion matrix C . Entries at the diagonal C_{ii} represent the number of correct classified image with class label i .

Wrong classified images can be found on all non-diagonal entries C_{ij} , $i \neq j$: such entries represent the number of (real) class i which are (wrong) classified as class j .

We added two visualizations of the confusion matrix to this report. In one visualization the entries are color coded, in the other visualization the numeric values can be found.

In both visualizations, rows represent the real classes, while the columns represent the classified classes.

The class labels are values between 1 and 8. The mapping between the numeric value of the classes and the names of the classes can be found in this list:

- 1 = bedroom
- 2 = forest
- 3 = kitchen
- 4 = livingroom
- 5 = mountain
- 6 = office
- 7 = store
- 8 = street

To get the percentage of correct classified images, we have to sum up all diagonal entries of C and divide this sum by the sum of all entries of C . This gives a value of $473/800=0.5913$, which is about 60% as supposed in the assignment.

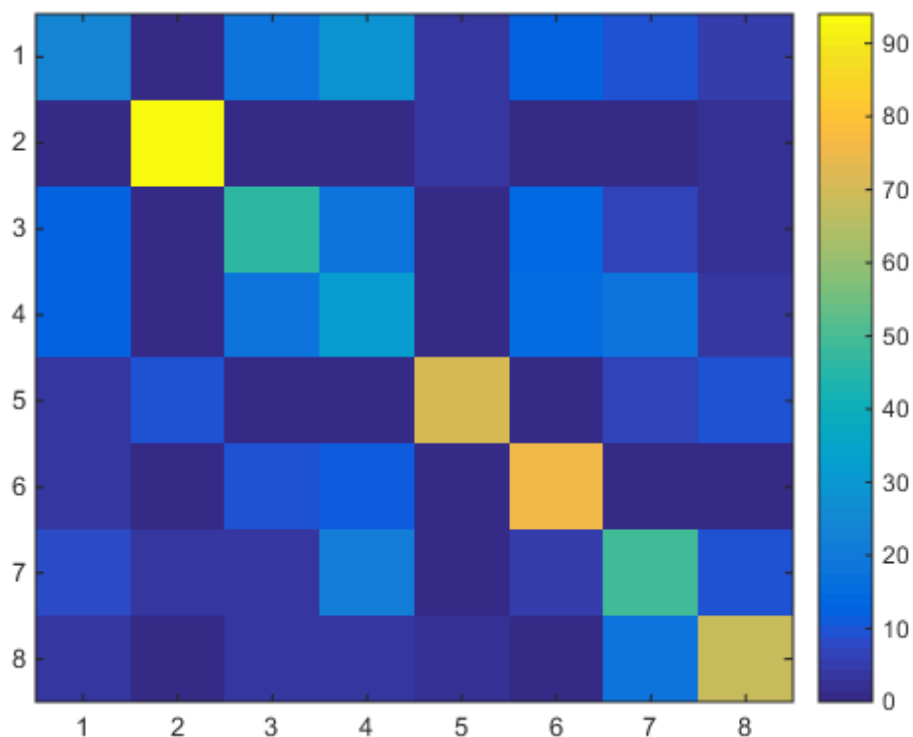


Fig: confusion matrix, color coded

	1	2	3	4	5	6	7	8
1	26	0	14	30	2	14	9	5
2	0	94	0	0	4	0	0	2
3	10	0	44	20	1	15	8	2
4	11	0	19	38	0	15	14	3
5	3	10	0	0	71	0	4	12
6	4	0	13	16	0	67	0	0
7	4	5	4	18	1	4	55	9
8	0	1	2	4	2	2	11	78

Fig: confusion matrix, numeric values

When comparing the numeric class labels with the class names, one can see that the classification of forests works pretty good. Also other “natural” scenes have a good classification rate.

Problems occur when classifying categories such as bedroom, kitchen or store. They appear to be pretty similar to this method.