

Classification of Images into specific Scene Categories

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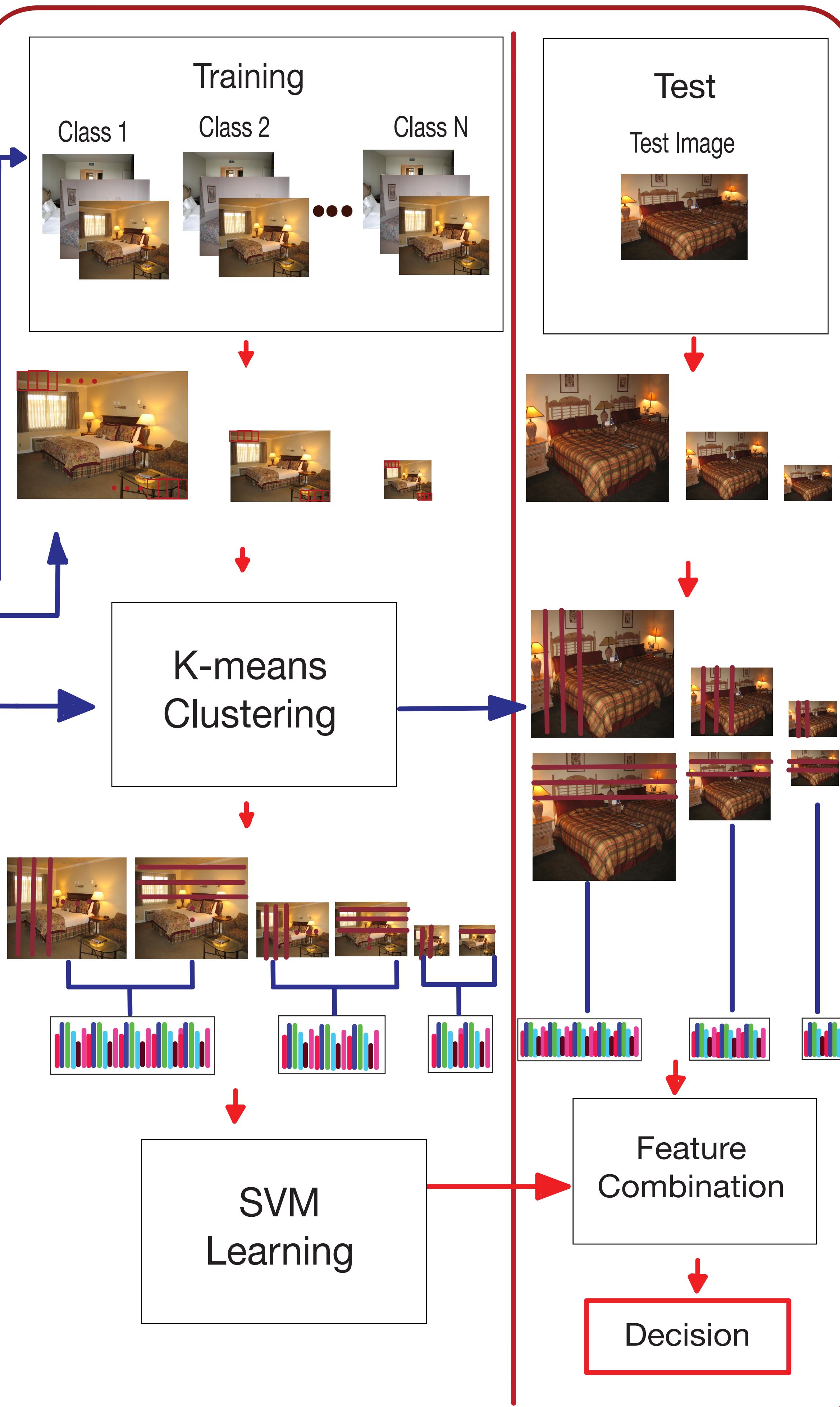
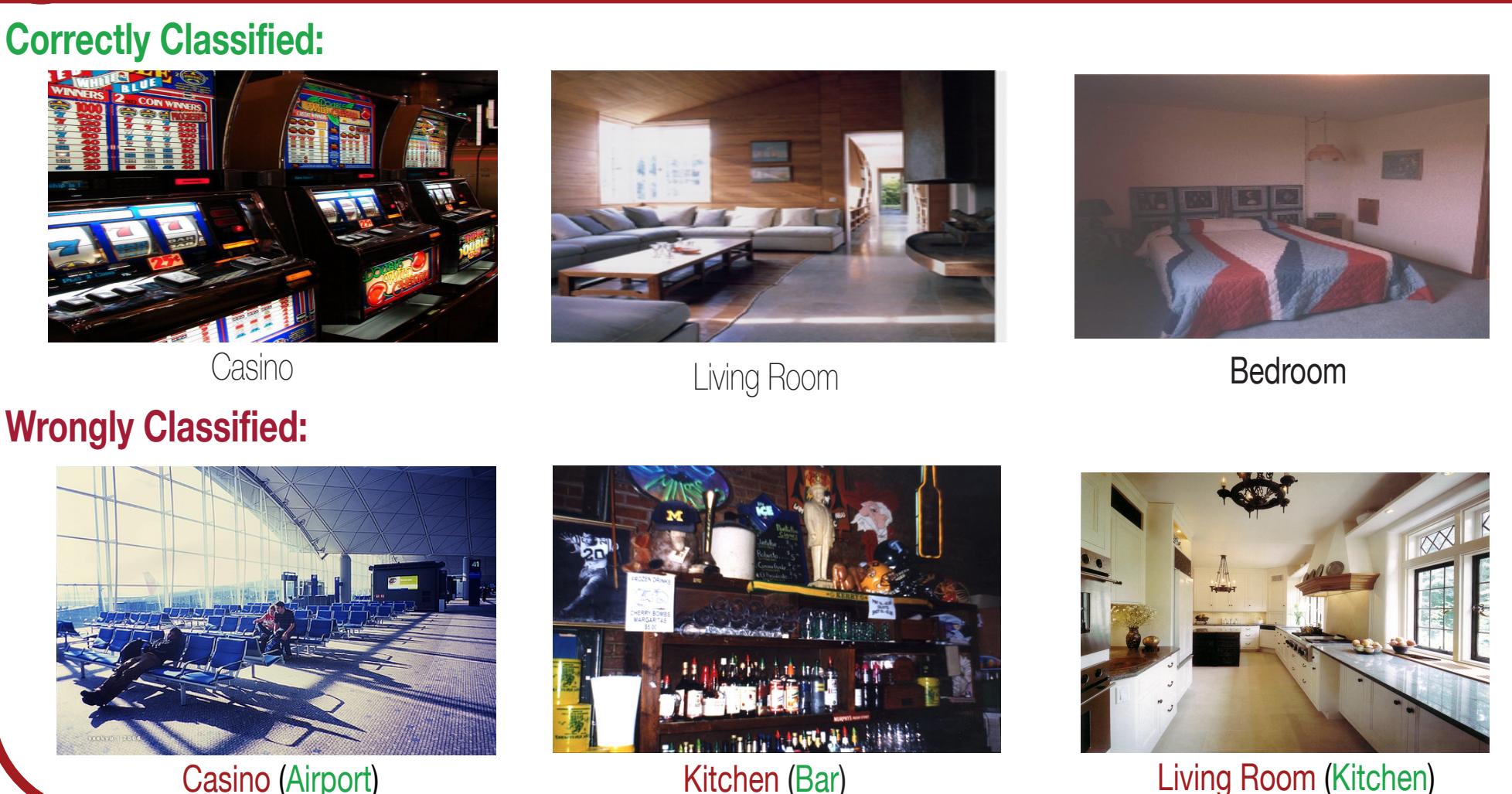
Motivation

- Websites like Yelp/TripAdvisor/FourSquare are overflowing with images of places.
- Images are mostly uploaded by users rather than owners of places.
- Lack of proper sub-categorization makes it difficult for users to select places by navigating through huge data sets of images

Steps

- Load training Images
- Create multi resolution images and locate SIFT features in these partitions
- Cluster the features and generate codebook
- Compute histogram of codeword so that the spatial information is intact
- Train SVM on the generated codebook
- Take a test image, generate SIFT features, pass it to SVM classifier to classify it into a class

Classification



Performance Evaluation

Accuracy Measure = Sensitivity / Recall
Sensitivity = True Positive / (True Positive + False Negative)
The results are displayed in the form of confusion matrix below:

Results

	Airport	Bar	Bedroom	Casino	Kitchen	LivingRoom	Accuracy
Airport	1	1	7	19	7	10	2
Bar	0	2	7	22	5	11	4
Bedroom	0	0	13	16	3	18	26
Casino	0	0	4	56	1	12	77
Kitchen	0	0	17	5	7	20	14
LivingRoom	0	0	5	10	1	34	68

Overall Accuracy = 35.03 %

Summary and Future Work

- The results we got from our current implementation can be found from the confusion matrix displayed above. In our later work, we plan to include more classes.
- We plan on getting better classification accuracy when the image has noise and unexpected items in them scene.
- We are also planning to integrate with a live application such as Yelp so that it will be of help to user in real time.

References

- 1) "Scene classification using a multi-resolution bag of features model" by Li Zhou, Zongtan Zhou and Dewen Hu
- 2) Dataset - <http://web.mit.edu/torralba/www/indoor.html>