Sapienza University of Rome, Italy
Master in Artificial Intelligence and Robotics
Machine Learning (2018/19)

Homework 2

Luca Iocchi

Homework 2. Venice Boat Classification

- Download and understand MarDCT Classification data set
- Define an image classification problem for Venice boats
- Implement or use a classifier for the chosen problem
- Describe the evaluation procedure and the results (not only accuracy)
- Write a report describing: the specific problem chosen, the classification algorithm implemented, and the results
- Submit the report (PDF version only) and the code (ZIP file) through Classroom

Note: any programming language, any library, any tool is allowed.

Reference: MarDCT data set
`http://www.diag.uniroma1.it/~labrococo/MAR/classification.htm`

Homework 2. Venice Boat Classification

Examples of problems

- Classification of 5 general classes
- Classification of 24 specific classes
- Classification of n (< 24) specific classes
- Binary Classification (1 vs. others)
- Counting instances of general/specific classes

Homework 2. Venice Boat Classification

Cell	Alg.	Acc. spec.	Acc. gen.	Count spec.	Count gen.
sc5	KNN	56.79 %	66.25 %	63.45 %	77.47 %
	J48	54.56 %	66.79 %	**91.41 %**	**95.79 %**
	RF	**66.20 %**	**75.13 %**	70.40 %	81.08 %
sc9	KNN	54.66 %	67.18 %	62.91 %	77.28 %
	J48	52.23 %	65.53 %	**88.35 %**	**93.79 %**
	RF	**61.41 %**	**72.86 %**	73.69 %	86.41 %
sc12	KNN	38.87 %	56.82 %	64.62 %	77.77 %
	J48	39.97 %	57.98 %	**89.39 %**	**97.34 %**
	RF	**51.83 %**	**65.54 %**	70.37 %	78.07 %
sc33	KNN	39.93 %	59.16 %	60.69 %	77.19 %
	J48	39.65 %	58.30 %	**90.77 %**	**96.64 %**
	RF	**49.93 %**	**65.26 %**	69.73 %	86.17 %

Cell	Test	Acc. spec.	Acc. gen.	Count spec.	Count gen.
sc5	20130412	73.14 %	79.08 %	77.50 %	88.11 %
sc33	20130909	36.10 %	51.01 %	47.15 %	69.98 %

Homework 2. Venice Boat Classification

Possible approaches

- Feature extraction + Classifier
- Deep features + Classifier
- (Image Pre-processing) + CNN