MLRF Lecture 06

J. Chazalon, LRDE/EPITA, 2019

with **Nicolas Boutry**
as guest lecturer

Agenda for lecture 6

1. Introduction
    - Classifier evaluation (dataset splitting, lecture 5 part 4.2)
2. Some classifiers - part 2
3. More theory about classifiers
4. [Nicolas] Introduction to next practice session
5. Course conclusion, questions and answers, feedback, etc.

Introduction

Lecture 06 part 01

Previously, in MLRF…

Summary of last lecture

Image classification overview

- *Instance* vs *category* recognition
- Pipeline: feature extraction > encoding > pooling > classification
- Our approach: input = vectors, output = integers
- train/test separation (first mention)

Classifiers

- Dummy
- kNN
- Distance based
- Generative probabilistic (Naive Bayes…)
- Linear discriminant probabilistic
  - Logistic regression, SVM
  - multiclass

Classifiers (continued)

- Non-linear discriminant probabilistic
  - Data preprocessing
    - Explicit embedding
    - Kernel trick

Evaluation

- Confusion matrix
- {true,false} {positive,negative}
- Accuracy
- How to plot PR curve
- ROC curve
- AUC

Debriefing of practice session 5

Content

Bag of Visual Words classifier

1. Load resources
2. Train a BoVW model
3. Split the dataset into training and validation sets
4. Compute the BoVW descriptor for each image
5. Prepare training structures
6. Train a classifier and evaluate its performance
7. Display some results
8. Test on meme images
9. Compute the results on the test set
   and export them

Discussion

- Who completed part 1? 2? …
- Did everyone submitted their results?
  - results.json
  - notebook.ipynb
- Any remarks, comments, questions?
- Things to keep, change, remove?

Practice session 5: Take home messages

BoVW is linear classification friendly

- And linear classifiers are to be prefered whenever possible

Data preparation is tedious

- An important part of the time dedicate to data analysis
- Plus we prepared a lot of things for you in the previous sessions!

Scikit-learn is easy and super powerful

- Classifier evaluation in 1 line
- But there is more: parameter tuning, cross-validation, etc. in 1 or 2 lines
- Data preprocessing + classification (pipelines) in 1-3 lines…

Next practice session

later with Nicolas