DIPARTIMENTO
DI INGEGNERIA
DELL'INFORMAZIONE

UNIVERSITÀ
DEGLI STUDI
DI PADOVA

LAB2: CLASSIFICATION WITH SVM

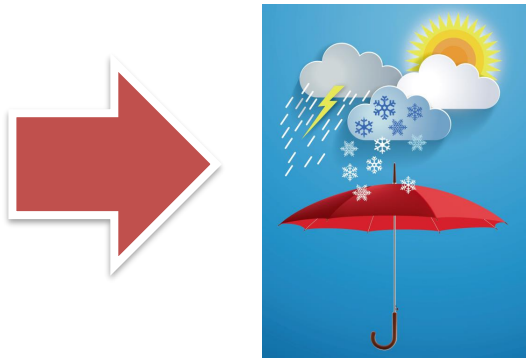
Machine Learning 2022

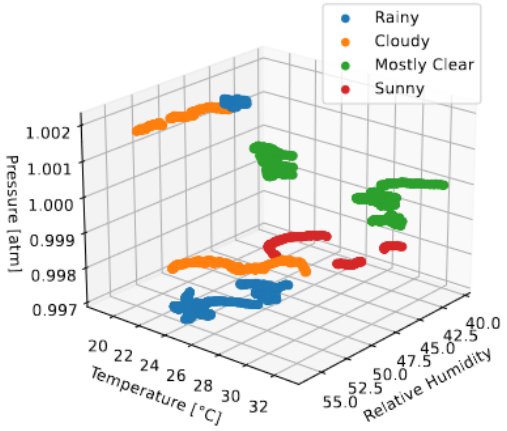
(P. Zanuttigh – ICT and Physics of Data)

Smart Glasses

- The provided dataset contains data recorded using the **Luxottica I-SEE glasses** in outdoor conditions
- These devices provide multiple sensors mounted inside the glasses, which can be accessed through a Bluetooth connection
- The recorded data include humidity, pressure, temperature and many other sensors
- We will also add noise to make the task more challenging → try to see what happens with different levels of noise

Classification Task





Each training sample contains 3 features acquired with the I-SEE glasses

1. *Humidity*
2. *Temperature*
3. *Atmospheric Pressure*

Task: classify data into 4 classes, sunny, mostly clear, cloudy, rainy

- Load the data file, divide into train and test sets
- Perform Classification with SVM

ID	***Label***
0	Sunny
1	Rainy
2	Cloudy
3	Mostly Clear

LAB2: Classification of Weather Conditions

- Classify weather conditions
- Use Support Vector Machines (SVM)
- Try different Kernels and parameters
- Implement cross validation to estimate parameters
- Visualize the results with confusion matrices

Your Task

- Complete the jupyter notebook
  - FIRST THING TO DO: you need to put your name and ID number in the notebook
  - You can use the ID also as seed for random number generators, try different seeds
  - The notebook has missing code: need to fill in what is missing
  - You must write the answer to all the questions in the notebook
  - But do not change the structure or the input data files, they will not be submitted
- Check that the notebook run properly from the beginning with the provided data
  - use the `"restart kernel&run all"` command
- Save them as `surname_name_lab2.ipynb`
- Submit on elearning

Timeline

- Fri 17/11: Homework released
- Fri 24/11: Lab 2 (rooms Te+Ue)
- **Thu *30*/11**: Delivery deadline
- The outcome is an on-off mark (i.e., +1 for the exam mark if the homework is reasonably done)