



UNIVERSIDADE  
CATÓLICA  
PORTUGUESA

BRAGA

# Machine Learning

Session 7 - PL

## Unsupervised Learning – Dimensionality Reduction

Degree in Applied Data Science

2024/2025

# Dimensionality Reduction with Python

- Scikit-Learn:
  - [https://scikit-learn.org/stable/modules/unsupervised\\_reduction.html](https://scikit-learn.org/stable/modules/unsupervised_reduction.html)
  - <https://scikit-learn.org/stable/modules/manifold.html>
- In scikit-learn clustering methods follow the fit-transform methods:
  - "fit": Learns patterns from the data.
  - "transform": Applies learned transformations.
  - "fit\_transform": Combines fitting and transforming in one step.
- UMAP:
  - <https://umap-learn.readthedocs.io/en/latest/>

# Dimensionality Reduction with Python

- Scikit-learn:
  - PCA:
    - <https://scikit-learn.org/stable/modules/generated/sklearn.decomposition.PCA.html>
  - MDS:
    - <https://scikit-learn.org/stable/modules/generated/sklearn.manifold.MDS.html#sklearn.manifold.MDS>
  - t-SNE:
    - <https://scikit-learn.org/stable/modules/generated/sklearn.manifold.TSNE.html#sklearn.manifold.TSNE>
- UMAP:
  - [https://umap-learn.readthedocs.io/en/latest/basic\\_usage.html](https://umap-learn.readthedocs.io/en/latest/basic_usage.html)

# Exercises:

- Notebooks on the github repository:
  - Notebook with examples:
    - `exercises/session07/examples.ipynb`
  - Notebook with exercises:
    - `exercises/session07/exercises.ipynb`