Mini-project n° 3 – SSL for Anomaly Detection

The objective of this mini-project is to train compare different SSL strategies by evaluating them on an Anomaly Detection downstream task.

You will be using two anomaly detection datasets:

- The MVTec AD datase (download from MVTec AD). Perform your experiments on AT LEAST the following categories: bottle, hazelnut, capsule, toothbrush.
- The AutoVI dataset (download from AutoVI). Perform your experiments ONLY on the following category: engine wiring.

For each of the categories, you are asked to:

- Train AT LEAST three different SSL models (masked autoencoder, contrastive model, inpainting model, colorizing model, siamese network...) using only the normal, training data.
- Use the model loss as an anomaly score and evaluate the anomaly score's discriminative power by plotting the ROC curve and the AUROC metric.

Points will be awarding according to the following criteria:

- The notebook is clearly written, contains markdown cells with all necessary explanations, and the code cells are well commented.
- Explanation and arguments of the different model choices, architecture choices and hyper-parameter choices (which need not be the same for all categories!).
- Clear comparison and visualization of the results (plots, tables...)

Extra bonus points will be awarded according to the following criteria:

- Originality of the model choice (i.e. choosing models different than those seen during the TP)
- The obtained AUROC metrics will be compared between different teams and bonus points will be given according to the rankings.