

Homework 5

2-AIN-150, Winter 2025

Deadline: 10.11.2025, 23:59

Before you start solving the homework, please read the general instruction at the end of the document. Submitted solutions should be your own. Do not copy and do not try to find solution in literature or over the internet.

Nonlinear SVM

Read carefully what you should submit.

Consider SVM with kernel $K(\vec{x}, \vec{y}) = e^{\gamma \|\vec{x} - \vec{y}\|_2^2}$ and data with two input attributes.

Generate at least three simple datasets (which differ in number of samples, amount of noise or decision boundary) and visualize effect of hyperparameters C and γ on trained prediction function of SVM. You should not use the dataset from given template. (Visualization is generating reasonably good set of pictures, which demonstrate effect of parameters).

Pictures, description of your datasets and short commentary should be submitted via classroom, ideally in PDF form.

Python instructions There is a file `template.py`, which shows generation of the dataset (doing XOR), usage of SVM and visualization of the result. You need to have scikit-learn and matplotlib installed. You can also use stuff from tutorial about SVM.