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Machine Learning for Visual Computing

Assignment 2

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1 Assignment 2

1.1 The dual optimization problem

Tasks:

- Generate a suitable training set of linearly separable data
- Plot the input vectors in \mathbb{R}^2 and visualize corresponding target values (e.g. by using color).

Figure 1: Plot of the input vectors with the target value visualized by colour.

Figure 1 shows the input vectors.

- Visualize the support vectors and plot the decision boundary.

Figure 2: Plot of the transformed input vectors with the target value visualized by colour.

Figure 2 shows the transformed input vectors.

1.2 The kernel trick

Tasks:

- Try different values for sigma (the RBF parameter).
- Generate a non-linearly separable training set, plot the data, visualize the support vectors and plot the decision boundary.

Figure 3: Plot of the decision boundary in the original data space found by the perceptron (green curve) together with labelled data points.