

Support Vector Regression Assignment

Advanced House Price Prediction

The target of this assignment is to use the SVR to predict the prices of houses in the dataset we used before for regression.

The Support Vector Regressor algorithm contains many hyper-parameters that needs tuning in order to get the best performance.

We are supposed to decide the best hyper-parameters for the SVR and compare its performance with linear regression on the test data.

Please tune these hyper-parameters:

- 1) Linear kernel SVM (construct a loop that finds the best C hyper-parameter)
- 2) Polynomial Kernel SVM (construct a loop that finds the best polynomial degree d, the best C, the best coef0, and the best Gamma Hyper-parameters)
- 3) RBF Kernel SVM (construct a loop that finds the best C, and the best Gamma Hyper-parameters)
- 4) Try different values of the epsilon (start with 0.01 then increase it)

One of the advantages of the SVR is that it does not perform explicit basis expansion of the inputs but uses the kernel trick instead. This should be more memory efficient if you choose to perform very high basis expansion (polynomial of degree 20 for example). In order to feel this advantage in the SVR, perform these trials:

- 1- Perform linear regression with explicit basis expansion (using Polynomial Features library as we did before) with degree 50
- 2- Try SVR using the polynomial kernel with degree 50.

Compare the memory consumption and running time of both trials. Write your comment and report if there is a difference.