Seminar outline about SVM

Lorenzo Zanolin

1 Introduction

What are SVM. It will follows a brief explanation about why this technique is used (it's classical uses) and a brief comparation between SVM's and Neural Networks [2].

2 Mathematical definition

Step by step explanation of basic definitions, exploiting graphical examples. Equations of margins, decision boundary, distance and cost function will be presented; a small digression on the *soft-margin extension*. All the previous examples are based on *linearly separable data*.

3 Non linearly separable data

Introduction to the problem of non linearity, exploiting a visual example. Then, it will be presented the *kernel trick*, more precisely the *Gaussian Radial Basis Function* [1].

4 SVM used in IR

It will be presented a small example [3] that covers how SVM will be used, in a *IR* specific context, to classify documents as relevant or not.

References

[1] Nello Cristianini and John Shawe-Taylor. *Support Vector Machines*, page 93–124. Cambridge University Press, 2000.

[2] Vikramaditya Jakkula. Tutorial on support vector machine (svm). *School of EECS, Washington State University*, 37(2.5):3, 2006.

[3] Hamid Khalifi, Abderrahim Elqadi, and Youssef Ghanou. Support vector machines for a new hybrid information retrieval system. *Procedia Computer Science*, 127:139–145, 2018.