

# Learning with Kernel Methods and Applications

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## **Abstract**

Kernel methods have become a well established tool within machine learning. They have been used across a wide range of applications such as recognizing handwritten digits, to face identification, text categorisation, bioinformatics, database marketing, manufacturing and weather prediction. In this short course I will give an introductory overview of this subject. I start with Parzen windows and Support Vector Machines (SVMs) for performing binary classification before considering learning in the presence of noise using robust optimization. Other variations of SVMs such as the analytical center machine are also discussed. I also discuss prediction with real-valued outputs and novelty detection. Finally, I give an overview of the main types of kernels which are used in practice and discuss several applications such as weather prediction.