SEMINARIOS DEL DEPARTAMENTO DE FÍSICA FUNDAMENTAL

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Pattern Recognition in Data Mining with Supervised Learning: a Business Case Study

"What must one know a priori about an unknown functional dependency in order to estimate it on the basis of observations?" (Vapnik, 1995).

The growing interest in data mining is motivated by this old common problem of finding hidden patterns in the empirical data. The use of pattern recognition for extracting knowledge from large data sets is becoming a key role in many areas of industry, government and science, and efficient techniques have been widely used for 'real-applications'.

This seminar addresses existing solutions for supervised learning in data mining with particular emphasis in 'real-world' problems.

Alejandro Chinea

Departamento Física Fundamental, UNED

Is it possible to extract brain metabolic pathways information from in vivo H nuclear magnetic resonance (NMR) spectroscopy signals?

In vivo H nuclear magnetic resonance (NMR) spectroscopy is an important tool not only for assessing the metabolic status of brain tissue but as a mean of performing non-invasive quantitative assessments of brain tumor glucose metabolism. Brain tumors are considered as fast-growth tumors because of their high rate of proliferation (average transfer in days or weeks). Tumor cells exhibit profound genetic, biochemical and histological differences with respect to the original non-transformed cellular types. Furthermore, the overall metabolic demand on tumor cells is significantly higher than on most other tissues. Therefore, there is a profound interest from the clinical investigator viewpoint in understanding the role of brain metabolites in normal and pathological conditions and especially on the development of early tumor detection techniques.

However, most of the currently analysis and diagnosis techniques based on NMR spectroscopy ignore the dynamic aspects of these signals. In this talk, we shall firstly provide a framework for the analysis of NMR spectroscopy signals from a machine learning point of view. Secondly, the dynamic aspects of the signals will be analyzed using elements from the Bifurcations and Chaos theory as a way of understanding their underlying structure.

Jueves, 13 de mayo de 2010, 15:30-16:15 y 16:15-17:00 h

Sala Enrique Linés, Facultad de Ciencias, Senda del Rey, 9