

THE CRM APPLIED MATHEMATICAL PHYSICS (CAMP) SEMINARS



CENTRE DE RECERCA MATEMÀTICA

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Introduction to Topological Data Analysis and an application to fMRI data

Abstract:

Recently a number of techniques rooted in algebraic topology have been proposed as novel tools for data analysis and pattern recognition. The fundamentally new character of these tools, collectively referred to as TDA or topological data analysis, stems from abandoning the standard measures between data points (or nodes, in the case of networks) as the fundamental building block, and focusing on extracting and understanding the “shape” of data at the mesoscopic scale. In doing so, this method allows for the extraction of relevant insights from complex and unstructured data without the need to rely on specific models or hypotheses.

Techniques like persistent homology have been recently used with success in biological and neurological contexts and play a key role in understanding of complex systems in a wide range of fields by extracting useful information from big datasets.

In this talk it is given a TDA introduction and it is showed how taking advantage from persistent homology and summarizing it in the so called persistent scaffold we are able to detect differences between subjects before and after taking a drug, in this case LSD, from fMRI data.

Date: January 23, 2017

Place: Room C1/028

Time: 12:00

