CMUP
Centro de **Matemática**
Universidade do Porto

Dynamical Systems Seminar

Date. December 6, 14h30m

Place. Room M031

Speaker. Acilina Caneco[1] (ISEL – CIMA – Universidade de Évora)

Title. Synchronizability of chaotic nonlinear dynamical systems

Abstract. Synchronization is a fundamental nonlinear phenomenon, which can be observed in many real systems. We study the influence of the connection topology of a network in the synchronization interval and we obtain results concerning the amplitude of this interval in terms of the local Lyapunov exponents and the topological entropy of the nodes. Moreover, we study the evolution of the information flow associated with a topological order in networks. The network topological entropy measures the complexity of the network topology and it is expressed by the Perron value of the adjacency matrix. We conclude that, as larger the network topological entropy, the larger is the rate with which information is exchanged between nodes of networks.

Applying these concepts to the population dynamics area, we study networks having in each node a von Bertalanffy's and a Richards' model. We prove some results about the synchronization level when fixing the network topology and changing the local dynamics expressed by the Lyapunov exponents, which depends on the model parameters.

[1] Acilina Caneco foi Professora Adjunta na Área Departamental de Matemática do Instituto Superior de Engenharia de Lisboa. Doutorou-se em Matemática na Universidade de Évora com o tema de dissertação *Sincronização caótica de sistemas dinâmicos não-lineares acoplados*. Actualmente está aposentada mas continua a fazer investigação na área de sincronização.

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