

SEMINARIO

APRENDIZAJE DE MAQUINAS

EXPOSITOR

*Dr Alberto J. M. Martín
(postdoc, DLab, Fundación Ciencia & Vida)*

TITULO

Inference of Gene Regulatory Networks from Gene Expression Data using Artificial Neural Networks

Abstract: Gene Regulatory Networks (GRNs) are directed networks where nodes represent genes, and edges exist solely if the Transcription Factor (TF) encoded by a source gene directly regulates the expression of another target gene. Two main approaches exist for the inference of GRNs, high-throughput experiments and computational methods that solely make use of gene expression data. While the first ones are expensive and time consuming, the second ones are faster and require fewer resources. Computational methods for the inference of GRNs can be broadly classified into supervised, where examples with known labels are needed, and unsupervised, e.g., correlation coefficients, where no known examples are required. Whereas the majority of computational methods benefit from the use of as many expression experiments in as diverse conditions as possible, approaches that use a single experiment are few or almost nonexistent. This work presents advances in the development of a supervised method for the inference of GRNs based on Artificial Neural Networks (ANNs). Our method only uses gene expression levels from a single time series expression experiment and several correlations computed between TF coding genes and their possible targets expression. Notably, known reference GRNs are noisy, static and highly unbalanced so we created new procedures to properly deal with these characteristics.

Viernes 22 de Enero a las 15:00 hrs, Sala de Seminarios John Von Neumann CMM, Beauchef 851, Torre Norte, Piso 7.