FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS UNIVERSIDAD DE CHILE

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SEMINARIO DOBLE APRENDIZAJE DE MÁQUINAS

Primera Charla (1500hrs).

Título: Latent distance estimation for random geometric graphs

Autor: Ernesto Araya (Université Paris-Sud 11)

Abstract: Random geometric graphs are a popular choice for a latent points generative model for networks. Their definition is based on a sample of n points $X_1,X_2,\cdots,X_n$ on the Euclidean sphere~$\mathbb{S}^{d-1}$ which represents the latent positions of nodes of the network. The connection probabilities between the nodes are determined by an unknown function (referred to as the ``link'' function) evaluated at the distance between the latent points. We introduce a spectral estimator of the pairwise distance between latent points and we prove that its rate of convergence is the same as the nonparametric estimation of a function on $\mathbb{S}^{d-1}$, up to a logarithmic factor. In addition, we provide an efficient spectral algorithm to compute this estimator without any knowledge on the nonparametric link function. As a byproduct, our method can also consistently estimate the dimension d of the latent space.

Segunda Charla (1545hrs)

Título: An Introduction to Reinforcement Learning and Reward Machines.

Autor: Rodrigo Toro (University of Toronto)

Abstract: In Reinforcement Learning (RL), an agent is guided by the rewards it receives from the reward function. Unfortunately, it may take many interactions with the environment to learn from sparse rewards, and it can be challenging to specify reward functions that reflect complex reward-worthy behavior. We propose using reward machines (RMs), which are automata-based representations that expose reward function structure, as a normal form representation for reward functions. We show how specifications of reward in various formal languages, including LTL and other regular languages, can be automatically translated into RMs, easing the burden of complex reward function specification. We then show how the exposed structure of the reward function can be exploited by tailored q-learning algorithms and automated reward shaping techniques in order to improve the sample efficiency of reinforcement learning methods. Experiments show that these RM-tailored techniques significantly outperform state-of-the-art (deep) RL algorithms, solving problems that otherwise cannot reasonably be solved by existing approaches.

Martes 07 de enero a contar de las 15:00 hrs, Sala Jacques L Lions CMM, séptimo piso, torre norte de Beauchef 851.

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