

AGCO Seminar

Speaker: David Salas, Universidad de O'Higgins.

Title: Mean-Field Opinion Dynamics in Random Graphs.

Abstract:

We consider a set of agents in a network having different opinions over a binary subject. The network is encoded as a (undirected or directed) graph, and each opinion is represented as a value between 0 and 1. At each discrete stage, each agent updates her opinion as a convex combination between the average opinion of her neighbors and her intrinsic opinion, which coincides with its initial opinion. It is well known that such dynamic converges to a stable opinion, which can be computed by inverting a matrix associated with the adjacency matrix of the network. When the network itself is a random graph, the stable opinion becomes a random variable, and when the number of agents is large, computing the expected value of the stable opinion by sampling methods can become prohibitively expensive: indeed, for each sample, it is necessary to invert a large matrix. In this talk, we study the pertinence of considering a mean-field model to approximate the expected value of the stable opinion. That is, by considering an “average network”, we study the gap between the expected value of stable opinions and the stable opinion over the average network. We show, under mild hypotheses, that for undirected Erdős-Rényi random graphs under the connectivity regime, the gap measured with the ℓ_{∞} -norm vanishes as the size of the network grows to infinity. Moreover, we show that for directed Erdős-Rényi random graphs, the same result holds for the gap measured with any ℓ_{ρ} -norm, for $\rho \in (1, \infty]$, by slightly increasing the connectivity regime. This talk is based on a joint work with Javiera Gutiérrez-Martínez (Universidad de Chile) and Víctor Verdugo (Pontificia Universidad Católica de Chile).

When: May 14, 3:00 pm - 4:00 pm.

Where: Sala de Seminario John Von Neuman, 7th floor, CMM, Av. Beauchef 851, torre norte.