

Optimization and Equilibrium Seminar

Speaker: Amine Hazzami (IECL, France).

Title: A stochastic differential Colonel Blotto game in a Stackelberg contract theory setting.

Abstract: The Colonel Blotto game is a resource allocation game where players decide where to focus their forces between different battlefields. We extend the standard Blotto game to a dynamic stochastic setting, in a time-continuous, two-player, zero-sum game. Using the dynamic programming principle, we explicitly characterize some Nash equilibrium strategies as well as the value of the game through a Hamilton-Jacobi-Bellman equation admitting a smooth solution. We formulate the game generally enough to allow for various rewards, as well as various drivers of randomness. We also present an application to cyber security contracts using Stackelberg games. In the Stackelberg game, the principal (company) would employ an agent (cyber-security specialist) to defend their network against a hacker in a Blotto game. We give a setting where we apply the equilibria of the dynamic Blotto game and the two-fold BSDE approach to solve the principal's problem. We also give numerical results using deep neural networks. This presentation includes joint works with Nabil KAZI-TANI (IECL, France), Vineeth SATHEESKUMAR-VARMA (CRAN, France) and Nicolas Hernandez (USM, Chile).

Miércoles 22 de Enero de 2025, a las 16:15 hrs.

Sala de Seminarios John Von Neumann del Centro de Modelamiento Matemático (Beauchef 851, Edificio Norte, Piso 7).

