FRIEDRICH-SCHILLER-UNIVERSITÄT JENA
Fakultät für Mathematik und Informatik

Institut für Mathematik

Seminar zur Stochastik

Donnerstag, 21. Dezember 2023
16 Uhr s.t.
SR 122 Carl-Zeiss-Str. 3

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(Institut Élie Cartan De Lorraine, Metz)

"A stochastic differential take on the Colonel Blotto game and applications"

Abstract: The Colonel Blotto game is a resource allocation game where players decide where to focus their "forces" between different "battlefields". It is unsurprisingly used to describe resource allocation in war but also in many other applications. We extend the standard Colonel Blotto game to a stochastic and dynamic 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 that admits 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 using graph theory, where a player would take the role of the hacker attacking a cyber network and the other that of the defender, the battlefields being the edges of the graph. The goal could for example be for the defender to maximize the algebraic connectivity of the subgraph with only the edges that they won.

This is a joint work with Nabil KAZI-TANI (IECL) and Vineeth SATHEESKUMAR VARMA (CRAN, CNRS).

Alle Interessierte sind herzlich eingeladen

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