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## COMPUTATIONAL AND PROBABILISTIC ASPECTS OF THE SHORTEST PATH UNDER ATTACKS GAME

Real life situations in which the data can be imprecise or uncertain can be modeled using two-player games. In this talk, we present a min-max two-player game called *Shortest Path under Attacks*, played on a weighted graph, between two players: the Pather, whose target is to choose a path between two fixed vertices, and the Attacker, whose target is to distribute a given budget over the edges and consequently, increase the weights of some of them.

During the talk, we will focus on the mixed-strategy variant of the game, where each player wants to find an optimal probability distribution over their possible actions. More precisely, we will prove that, in certain special cases, optimal strategies for the players can be found in polynomial time. Moreover, we will demonstrate that, in these cases, an optimal mixed strategy for the Pather is given by a probability distribution derived from the uniform distribution.

This is joint work with Armin Fügenschuh, and Konstanty Junosza-Szaniawski.