

Path Planning in the Presence of Adversarial and Asymmetric Threats

We introduce an ambush game in arbitrary 2D environments. Mobile Agent 1 needs to traverse a geometrical area from Point A to Point B. Mobile Agent 2, who is less mobile, can set one ambush to trap Agent 1. We address the question of what strategies Agents 1 and 2 should follow in order to optimize their respective payoffs. This continuous zero-sum game displays interesting geometrical properties closely linked to the max-flow/min-cut problem in continuous geometrical environments, a generalization of the more traditional max-flow/min-cut problem for discrete networks. The complexity of solving the game is discussed, as well as practical computational approaches. Path planning interpretations to the solution of the ambush problem will be discussed.