Differential games with exit costs

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1   Abstract

In this talk, I will treat a differential game where a running cost is paid until the trajectory remains inside a closed domain and then an exit cost is paid when the trajectory possibly exits. A major feature of the problem is that there are two different paid exit costs, in dependence on the fact whether the responsibility of the exit is due to the first or to the second player. This fact breaks the non-zero form of the game and reflects on the formulation of the boundary conditions for the corresponding Isaacs equations and on the the uniqueness of the corresponding viscosity solutions. Another interesting aspect concerns the existence of suitable non-anticipating strategies in order to have the continuity of the value functions.

In the case of decoupled dynamics, I will prove the continuity of the value functions, I will give a suitable formulation of the boundary conditions and a result of uniqueness for the Isaacs equations.

This kind of problem is motivated by the study of an infinite-horizon differential game with switching dynamics.