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Applications of topological games in optimization and nonlinear analysis

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Abstract: The aim of this talk is to demonstrate the usefulness of topological games in studying problems in different branches of mathematics. More precisely, we consider infinite positional topological games with perfect information between two players. A very well known example of such games is the Banach-Mazur game and its variants. We exhibit several instances when the existence of a winning strategy for one of the players in such games is a sufficient (and sometimes, also necessary) condition for the validity of certain important properties like: the validity of variational principles in optimization; characterization of Radon-Nikodym property in Banach spaces; and, existence of solutions to Eikonal equations.