



TIGR/MAFIA - the seminar you can't refuse

## **On the best response to factor-based strategies and other selected problems from (quantum) game theory**

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**Abstract:** In the first part of the talk we offer a new approach to modeling strategies of bounded complexity, the so-called factor-based strategies. In our model, the strategy of a player in the multi-stage game does not directly map the set of histories  $H$  to the set of her actions. Instead, the player's perception of  $H$  is represented by a factor  $\varphi : H \rightarrow X$ , where  $X$  reflects the “cognitive complexity” of the player. Formally, mapping  $\varphi$  sends each history to an element of a factor space  $X$  that represents its equivalence class. The play of the player can then be conditioned just on the elements of the set  $X$ . Strategies played by finite automata and strategies with bounded recall are the most prominent examples of factor-based strategies. Finally, we show that for recursive factor  $\varphi$  and for every profile of factor-based strategies there is a best reply that is a pure factor-based strategy. In the second (quite informal and interactive) part of the talk, we will discuss the quantum extension of the game theory, namely some links between quantum game theory and mathematical physics.