A vector bundle approach to Nash equilibria

Hirotachi Abo
University of Idaho (USA)

Mixed Nash equilibrium is a concept in game theory that determines an optimal solution of a non-cooperative finite game. Using so-called payoff tensors (tensors that express the possible choices for the players and the outcomes of such choices), one can interpret mixed Nash equilibria as points in the tensor space (called Nash equilibrium points). In this talk, we discuss a vector bundle interpretation of the tight upper bound for the number of Nash equilibrium points for a “generic” game (that is, the game with generic payoff tensors) obtained by R. McKelvey and A. McLennan.

The formula for the upper bound indicates when a generic game has no Nash equilibrium points. If a generic game has no Nash equilibrium points, then the payoff tensors with which the game has Nash equilibrium points form a subvariety. I will talk about the geometry of such a subvariety.

This is a preliminary report of the (still ongoing) project with Luca Sodomaco and Irem Portakal.