PANTHÉON-ASSAS UNIVERSITÉ PARIS

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LEMMA
Laboratoire d'économie mathématique et de microéconomie appliquée

SÉMINAIRE

DEGREE CENTRALITY, VON NEUMANN-MORGENSTERN EXPECTED UTILITY AND EXTERNALITIES IN NETWORKS

26 mars 2024
Lemma - Salle Maurice Desplas 4 rue Blaise Desgoffe 75006 PARIS

Séminaire du Lemma

Le LEMMA organise un séminaire, sur le thème « ***Degree centrality, von Neumann-Morgenstern expected utility and externalities in networks*** » le mardi 26 mars à 11h.

Agnieszka RUSINOWSKA (CNRS, Université Paris 1)

Résumé :

This paper aims to connect the social network literature on centrality measures with the economic literature on von Neumann-Morgenstern expected utility functions using cooperative game theory. The social network literature studies various concepts of network centrality, such as degree, betweenness, connectedness, and so on. This resulted in a great number of network centrality measures, each measuring centrality in a different way. In this paper, we aim to explore which centrality measures

can be supported as von Neumann-Morgenstern expected utility functions, reflecting preferences over different network positions in different networks. Besides standard axioms on lotteries and preference relations, we consider neutrality to ordinary risk. We show that this leads to a class of centrality measures that is fully determined by the degrees (i.e. the numbers of neighbours) of the positions in a network. Although this allows for externalities, in the sense that the preferences of a position might depend on the way how other positions are connected, these externalities can be taken into account only by considering the degrees of the network positions. Besides bilateral networks, we extend our result to general cooperative TU-games to give a utility foundation of a class of TU-game solutions containing the Shapley value.