

Topological Issues in Multiagent Resource Allocation Problems

Nicolas Maudet (Université Paris-Dauphine, F)

Resource allocation is a typical social choice problem which consists in allocating (optimally) a set of resources to a number of agents. We present recent results and discuss issues pertaining to the topological structure of negotiation/communication graphs, when allocations are iteratively and locally negotiated by autonomous agents, in a truly distributed manner.

Joint work of: Chevaleyre, Yann; Endriss, Ulle; Maudet, Nicolas

Full Paper:

<http://www.lamsade.dauphine.fr/~maudet/pubs/ChevaleyreEndrissMaudetAAAI2007.pdf>

Bibliography: Yann Chevaleyre, Ulle Endriss, and Nicolas Maudet. Allocating Goods on a Graph to Eliminate Envy. In *Proceedings of the 22nd AAAI Conference on Artificial Intelligence (AAAI-2007)*, pp. 700–705, AAAI Press, July 2007.

Determining Winners in Weighted and Unweighted Sequential Majority Voting

Maria Silvia Pini (Università di Padova, I)

In weighted sequential majority voting, preferences are aggregated by a sequence of pairwise comparisons (also called an agenda) between candidates. The result of each comparison is determined by a weighted majority vote among the agents. In this paper we consider the situation where the agents may not have revealed all their preferences. This is common in many real-life settings, due to privacy issues or an ongoing elicitation process. We study the computational complexity of determining the winner(s), given that some preferences may not be revealed and/or the agenda is not decided. We show that it is easy to determine if a candidate wins whatever the agenda. On the other hand, it is hard to know whether a candidate wins in at least one agenda for at least one completion of the agents' preferences. This is also true if the agenda can be represented by a balanced tree. The computational complexity of determining if the candidates win in at least one (balanced) agenda, for every completion of the agents' preferences remains an open question. We also consider the case of fixed agendas, and we show that in this case it is easy to determine if a candidate wins in the fixed agenda for at least a completion, or for every completion of the agents' preferences.

Keywords: Sequential majority voting, multiagent systems, uncertainty

Joint work of: Pini, Maria Silvia; Rossi, Francesca; Venable, Kristen Brent; Walsh, Toby