

Adjustable Autonomy in an Automated Negotiation Agent

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Abstract

For an agent carrying out negotiations for a suitable deal on a user's behalf, uncertainty may arise in some cases as to whether the user would find a particular offer acceptable. In these situations, rather than making the decision on its own of whether or not to accept the offer, the best strategy may instead be for the agent to consult the user on the purchase decision. Given the ability to modify its autonomy level, the agent could determine whether adjusting its autonomy to allow the user control over the decision would really be best, considering the benefits and costs that could result. Our aim is to develop a framework that would allow an agent to decide about autonomy adjustment during the course of negotiations, determining when an adjustment would be optimal. A factor to be considered is that waiting for a user response on an offer could lead to loss of other deals being negotiated for. As well, whether the user is present and the probability the user will respond if consulted must be taken into account. The approach we have taken is to formulate the problem as a Markov Decision Process in which the decisions of whether to ask about an offer and whether to accept an offer are made for each current and expected offer, and which allows for costs and benefits of actions to be assessed. The strategies produced by the framework will be tested to determine the impact of adjustable autonomy on enhancing agent actions.