

# Authority management in human-robot systems

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**Abstract:** In the context of human supervisory control of the mission of one or several robots (e.g. Unmanned Ground or Aerial Vehicles), authority sharing is a major issue: when several robot and human agents decide and act using the same resources, conflicts are likely to occur and may result in disasters. Therefore these agents must be coordinated: control has to be shared dynamically among them so that it should be the best given the current state of the human-robot system. In this paper authority sharing monitoring is an embedded function of the robot and is based on conflict detection and solving: conflicts involve objective mission ingredients (called "resources") such as physical resources, logical conditions, tasks, goals... A generic model of the "resources", conflict models and a formal definition of authority sharing are given. Conflict solving consists in re-allocating the control of one or several "resources" to the agent (the human or the robot) that is in the best position to have authority given the current state of the system.

**Keywords:** Adaptive autonomy, Authority sharing dynamics, human-robot interactions, Petri nets

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