

A temporal argumentation approach to cooperative planning using dialogues

Title	A temporal argumentation approach to cooperative planning using dialogues
Publication Type	Journal Article
Year of Publication	In Press
Authors	Pardo P ^[1] , Godo L ^[2]
Journal	Journal of Logic and Computation (doi:10.1093/logcom/exv007), In Press
Publisher	http://logcom.oxfordjournals.org/cgi/reprint/exv007?ijkey=aWAnus8yMkBCDS0&keytype
Abstract	<p>In this article, we study a dialogue-based approach to multi-agent collaborative plan search in the framework of t-DeLP, an extension of DeLP for defeasible temporal reasoning. In t-DeLP programs, temporal facts and rules combine into arguments, which compare against each other to decide which of their conclusions are to prevail. By adding temporal action to this argumentative logic programming framework, one obtains a centralized planning framework. In this planning system, it can be shown that breadth-first search is sound and complete for both forward and backward planning. The main contribution is to extend these results in centralized planning to cooperative planning tasks where the executing agents themselves are assumed to have reasoning and planning abilities. In particular, we propose a planning algorithm where agents exchange information on plans using suitable dialogues. We show that the soundness and completeness properties of centralized t-DeLP plan search are preserved, so the dialoguing agents will reach an agreement upon a joint plan if and only if some solution exists.</p>

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