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Refereed Article

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Relating Theories of Actions and Reactive Control

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Abstract: *In this paper we give a formal characterization of reactive control using action theories. In the process we formalize the notion of a reactive control program being correct with respect to a given goal, a set of initial states, and action theories about the agent/robot and about the exogenous actions. We give sufficiency conditions that guarantee correctness and use it to give an automatic method for constructing provenly correct control modules. We then extend our approach to action theories and control modules that have specialized sensing actions and that encode conditional plans. Finally we briefly relate our theory with the implementation of our mobile robot Diablo, which successfully competed in AAAI 96 and 97 mobile robot contests.*

This article has an *appendix* containing additional details for the results reported in it. The appendix is available from the ETAI web page for the article; it has been published and will be preserved like the main part of the article.

Appendices obtain page numbers starting with 1, and outside the page numbering of the ETAI issue.

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