

Multi-Robot Team Learning of Inherently Cooperative Tasks*

Lynne E. Parker

Center for Engineering Science Advanced Research
Computer Science and Mathematics Division
Oak Ridge National Laboratory
P. O. Box 2008
Oak Ridge, TN 37831-6355

ABSTRACT

In this talk, I will discuss our research in the development of learning methodologies for multi-robot cooperation. Our multi-robot learning is focused on the challenging domain of inherently cooperative tasks. The application that we study in this context is the Cooperative Multi-Robot Observation of Multiple Moving Targets (CMOMMT) problem, which we originally defined. The two learning approaches are (1) a reinforcement-learning based approach and (2) a neural-network based approach. In this talk, I will first define the CMOMMT task and then present results from a hand-generated (non-learning) solution that we developed. I will then present two approaches we have developed for learning in this domain, comparing the results to the non-learning solution and to simple naive control solutions. The learning results show significant improvements over naive control solutions, with one of the approaches nearing the performance of the non-learning approach. The ultimate goal of this research is the development of general techniques for learning in multi-robot systems that extend beyond the CMOMMT domain presented in this talk.

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