



Investigation of Cooperative Behavior in Autonomous Wide Area Search Munitions

By Robert E. Dunkel

Biblioscholar Okt 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x6 mm. This item is printed on demand - Print on Demand Neuware - The purpose of this research is to investigate the effectiveness of wide-area search munitions in various scenarios using different cooperative behavior algorithms. The general scenario involves multiple autonomous munitions searching for an unknown number of targets of different priority in unknown locations. Three cooperative behavior algorithms are used in each scenario: no cooperation, cooperative attack only, and cooperative classification and attack. In the cooperative cases, the munitions allocate tasks online as a group, using linear programming techniques to determine the optimum allocation. Each munition provides inputs to the task allocation routine in the form of probabilities of successfully being able to complete the various tasks. These probabilities of success are based on statistical Poisson field theory. Weighting parameters are applied to the probabilities of success so that optimum settings can be determined via Response Surface Methodology. Results are compared within and across the various scenarios. Initial results did not reflect expected behavior (due to poor choice of responses to optimize). Experiments were modified and more desirable results obtained. In general, cooperative engagement alone attacks and kills fewer targets...



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