

12th ICCRTS

Adapting C2 to the 21st Century

Human and Software Factors for Successful System Adaptation

C2 Metrics and Assessment; Cognitive and Social Issues; C2 Technologies and Systems

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ABSTRACT

Machine learning is an important tool towards adaptive command and control. The Defense Advanced Research Projects Agency (DARPA) has implemented a program to build the first instance of a complete cognitive agent that uses machine learning. The program, called Personalized Assistant that Learns (PAL), is expected to yield new cognitive technology of significant value not only to the military, but also to business and academic sectors.

PAL uses a variety of learning algorithms to allow assistants to adapt to the operational needs of its human user. The PAL Boot Camp concept was created to address the training of these assistants to ensure that they are useful when they are deployed and that they will successfully learn to perform tasks.

As part of the Boot Camp experimentation, a simulation was created to determine what aspects were important in ensuring that assistants would enhance the performance of their users. The results of experimentation with the simulation show the relative importance of the methods of human use, observability, and patterns of initial training. This paper reports on these results.

OUTLINE

1. Introduction. Description of the issues involved in fielding systems that learn and adapt, the PAL program, and the boot camp concept.

2. Boot Camp Model and the Simulation. Describe the model being employed, the simulation, and the experiments that can be conducted using the simulation.

3. Experiment Design and Raw Results. Report on the experimental results and what they indicate about the important aspects of adaptation and learning.

4. Conclusions and Future Work.