Introduction

In recent years, there has been increasing awareness within the Air Force Research Laboratory (AFRL) that the commercial sector and academia are not producing human behavior representation technologies that are sufficient to meet all of the Air Force's modeling and simulation requirements. To address this shortfall, the Air Force Research Laboratory has increased its investment in this area through an initiative called the Agent-based Modeling and Behavioral Representation (AMBR) Project. One of the primary goals of the AMBR Project is to advance the state of the art in cognitive and behavioral modeling.

The AMBR Project

The AMBR Project is attempting to accomplish this by organizing a series of comparisons among alternative modeling approaches. Each comparison is overseen by a neutral moderator. The moderator contract, which lasts for the duration of the project, was awarded to a team of researchers from BBN Technologies. A single iteration of this comparison process involves the following steps:

1. Identify the modeling goals for this iteration – what cognitive/behavioral capabilities should be stressed?
2. Select a task domain that requires the capabilities identified in (1) and that is of relevance to AF modeling and simulation needs.
3. Borrow/Modify/Create a simulation of the task domain which either a human-in-the-loop or a human performance model can operate.
5. Modeling teams develop models that attempt to replicate human performance when performing the task.
6. Expert panel convenes to compare and contrast the models that were developed and the underlying architectures that support them.
7. Share the results and lessons learned with the scientific community, to include making available the simulation of the task domain and the human performance data.

Round 1a

The first iteration (Round 1a) of the AMBR Project is complete. The modeling goal in the first round was multi-tasking, and the task domain required a simplified version of en-route air traffic control. Modelers using ACT-R, COGNET, D-COG, and EPIC-Soar participated in Round 1. All were able to approximate the trends and central tendencies of the data to a reasonable extent, but naturally the particular implementation of multi-tasking capability differed across architectures. In the first half of this presentation, we will describe the characteristics each architecture possessed (and which characteristics needed to be added!) in order for them to reproduce multi-tasking behaviors that matched the human data.

Round 1b and Beyond

The Defense Modeling and Simulation Office (DMSO) is now sponsoring the conversion of the simulation environment and models, so that they are compliant with DMSO's High-Level Architecture (HLA). This is Round 1b. By the date of the AAAI Fall Symposium on Simulating Human Agents, we will be well on our way toward completion of Round 1b and finishing plans for the AMBR Project's next steps. In the second half of this presentation, we will provide an overview of the goals motivating Round 1b, as well as our current thinking with respect to the future of the AMBR Project.