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Team 4: Exploring Sharing Behaviors

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TEAM 4 MEMBERS

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INTRODUCTION

The U.S. DoD (OASD/NII) Command and Control Research Program (CCRP) has sponsored the design and development of a software environment for conducting human-in-the-loop experiments focused on information- and social-domain phenomena. This experiment has come to be know as the ELICIT Experiment (Experimental Laboratory for Investigating Collaboration, Information-sharing, & Trust). Over the course of several Project Albert International Workshops, EBR has strived to create and improve a simulation version of the experiment. Utilizing the NetLogo agent-based modeling environment, we have built upon prior work, augmenting the model to more explicitly represent cognitive and collaborative processes. During this week, Ms. Danielle Martin, Tony Costa, Karina Malvaez-Buenrostro, and Fidencio Vargas-Davila, have worked to study how sharing behaviors such as posting, direct sharing, hoarding, and processing affect an organization's performance in solving a simple cognitive task.

In the scenario participants received information about a future attack. The information is parsed into four question categories and the participant's mission is to gain sufficient knowledge related to each topic to solve the four questions. These information facts are periodically distributed and then shared via one on one interactions or website broadcasts. The network's objective is to solve the four task questions by combining and sharing the set of information facts. Participant actions are constrained by the network structure. Any given participant's awareness depends on what combination of facts they have seen.

Analysis Summary

Of the sixteen variables farmed throughout the workshop, a participant's propensity to share information had the greatest overall impact on solution time. The amount of information an agent is capable of processing on any given time step also proved to be influential over solution time. Other network parameters such as connectivity, symmetric communication links and homogeneity of the agents had little influence over the solution time.

When exploring the overall knowledge of the participants, the Edge organization has a high level of awareness of the solution space. The group was surprised to learn that network connectivity, the rate at which an agent processes information, and the quantity of information an agent can process have little impact on knowledge of the solution. Perhaps additional runs will clarify this point. Surprisingly, behaviors such as reciprocation and targeted sharing had only a small effect on the MOEs.

Immediate follow on activities include continuing to refine and analyze the model, and the redesign of the experimental design points to further explore the effects of the model parameters. In future efforts we are interested in looking for additional methods of representing the facts and the information quality levels associated with each. As a long term goal, we plan to inform development and execution of associated human experiments, and leverage information and data from ongoing experiments. Modeling human social and cognitive processes is a challenge. We hope that by exploring the data collected from the live experiment, our team will be able to more accurately reflect these processes in an agent-based modeling environment.

Additional information regarding the ELICIT Experiment can be found at:
http://www.dodccrp.org/html3/elicit.html