Productive Interdisciplinarity: The Challenge that Human Learning Poses to Machine Learning

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Overview

Recent efforts in the Hybrid Architectures for Learning Program sponsored by the Office of Naval Research were based on applying general computational hybrid models of learning to three human learning tasks. Each task had learning performance data available. The issue was to run the basic hybrid model on a selected task to verify the model's performance relative to the actual human data and to evolve the model, increasing the match between the learned performances, to obtain a better predictive/explanatory model of the human process.

There were three tasks used, an Air Traffic Controller simulation task (The Kanfer-Akerman ATC-Task ™), an Obstacle Avoidance or Navigation simulation task, and a Command Information Center(CIC) decision making task. Eight groups participated, selecting one of the three tasks. This symposium will present results from three groups on two of the tasks. These projects raise exciting new questions and issues specifically for machine learning approaches to the study of learning. Human learning presents challenging performance for current machine learning approaches to meet. Thus, cognitive modeling applications contribute to the understanding of computational approaches as much as to the understanding of human cognition.

Format for the Symposium

Dr. Helen Gigley Introduction to the Hybrid Architectures Program

Dr. Devika Subramanian* (devika@cs.rice.edu)
Rice University -- Learning the NRL Navigation Task

Dr. Bonnie John (Bonnie_John@cs.cmu.edu)
Carnegie Mellon University -- Short Introduction to the ATC-Task

Dr.PrasadTadepalli (tadepall@cs.orst.edu)**
Oregon State University -- Learning Hierarchical Control: Humans vs. Machines

Dr. Bonnie John *** -- Strategy use and its implications for computational models of learning

Dr. Susan Chipman -- Summary

Open discussion

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* Joint work Dr.Diana Gordon at Naval Research Laboratory and Dr. Sandra Marshall at San Diego State University.
** Joint work with Thomas G. Dietterich and Chandra Reddy at Oregon State University.
*** Joint work with Dr. Yannick Lallement, Novator Systems, Toronto, Ontario, Canada.