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SYMPOSIUM IN MEMORY OF ALLEN NEWELL

Soar as a Unified Theory of Cognition: Summer 1993

- Organizers:** John E. Laird, University of Michigan
Jill Fain Lehman, Carnegie Mellon University
Paul S. Rosenbloom, University of Southern California
Tony Simon, Georgia Institute of Technology
- Chair:** Paul S. Rosenbloom, University of Southern California
- Participants:** Paul S. Rosenbloom, University of Southern California
Overview of Soar as a unified theory of cognition: Spring 1993
Mark D. Wiesmeyer, University of Michigan
NOVA: Covert attention explored through unified theories of cognition
Rick L. Lewis, Carnegie Mellon University
An architecturally-based theory of human sentence comprehension
Scott B. Huffman, University of Michigan
*Learning from instruction: A knowledge level capability within
a unified theory of cognition*

Abstract

This is a symposium organized in memory of Allen Newell. Allen's central focus throughout his long and productive research career was the nature of the mind. The approach he pioneered in this study was the development of *Unified Theories of Cognition*. A unified theory of cognition (UTC) is a single set of interacting mechanisms that jointly support the full breadth and richness of human cognition. Though no theories have yet come close to full breadth or richness, significant progress is being made along a number of fronts. Continuing to strive to reduce the remaining difference is one of the most exciting and critical challenges facing cognitive science today.

During the last decade of Allen's career, his efforts focused on the development of a particular candidate unified theory, Soar. At the Twelfth Cognitive Science Conference in 1990, we presented, in symposium form, an update on the status of Soar as a UTC. We could think of no more appropriate way to remember Allen, and his lifelong commitment to his science, than to use

the present opportunity to provide a second update on this topic.

The presentations here were selected to illustrate some of the breadth and depth of the development of Soar as a UTC. The first presentation simply provides a general overview of Soar and its use as a UTC [Rosenbloom]. The subsequent presentations focus on three particular research efforts: visual attention [Wiesmeyer], sentence comprehension [Lewis], and learning from instruction [Huffman]. These efforts share a significant recent trend in the development of Soar by focusing on its interaction with the external environment. Among the three, they span behavior in a range of time scales for human cognition (from milliseconds [Wiesmeyer], to seconds [Lewis], to minutes [Huffman]), and model both specific quantitative measures and more general qualitative properties of human behavior.