Putting the "Human" into "Human Behavior Models"

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Intelligent Agents are often developed for the purposes of mimicking the behavior of a person performing a task. These "Human Behavior Models" (HBMs) (Pew and Mavor 1998) are often used to perform complex tasks such as flying airplanes in simulation, interacting as non-player-characters in games, participating in teammates in simulation-based training environments, etc. These models' level of "human-ness" can vary greatly across models and uses, at multiple levels. For the early work in this area, interest was primarily in the purely "rational" problem-solving aspects of human behavior: how does a human perform a task under normal conditions? These models are often guided by theory of human information processing, and typically included cognitive features such as memory, perception, and learning. But they also leave out many aspects of what we typically think of as "being human."

A growing body of research has expanded these concepts to include additional aspects of human behavior beyond problem solving, such as personality, emotion, and most recently, culture. Ideally, a "complete" human behavior model would incorporate all of these aspects parsimoniously with features of perception, memory, and learning. In this talk, I describe some initial work whose goal is the development of a theory-driven computational cognitive architecture that incorporates these multiple aspects of human behavior into a coherent whole for the purposes of building these hypothetical "complete" models of human behavior.

This work is inspired by work in cognitive architectures such as Soar (Laird 1987), but attempts to take them into areas of human behavior to which they have not been much applied – especially social and cultural areas. Taking cues from the literature on Cognitive Anthropology (D'Andrade 1995) and Cross-cultural Psychology (Matsumoto 2001), I discuss how we might use existing cognitive architectures as a starting point for implementing theories of culture and social cognition. I also discuss some of the new challenges that come with trying to incorporate ever more complex features into these architectures, and the models built from them.

References

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