Embodied Conversational Agents: Representation and Intelligence in User Interfaces

Justine Cassell

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Abstract

How do we decide how to represent an intelligent system in its interface, and how do we decide how the interface represents information about the world and about its own workings to a user? This article addresses these questions by examining the interaction between representation and intelligence in user interfaces. The rubric representation covers at least three topics in this context: (1) how a computational system is represented in its user interface, (2) how the interface conveys its representations of information and the world to human users, and (3) how the system's internal representation affects the human user's interaction with the system. I argue that each of these kinds of representation (of the system, information and the world, the interaction) is key to how users make the kind of attributions of intelligence that facilitate their interactions with intelligent systems. In this vein, it makes sense to represent a system as a human in those cases where social collaborative behavior is key and for the system to represent its knowledge to humans in multiple ways on multiple modalities. I demonstrate these claims by discussing issues of representation and intelligence in an embodied conversational agent -- an interface in which the system is represented as a person, information is conveyed to human users by multiple modalities such as voice and hand gestures, and the internal representation is modality independent and both propositional and nonpropositional.
Embodied Conversational Agents: Representation and Intelligence in User Interface. Justine Cassell MIT Media Lab E15-315, 20 Ames Street, Cambridge MA 02139 justine@media.mit.edu. I will demonstrate my claims by discussing issues of representation and intelligence in an embodied conversational agent – an interface in which the system is represented as a person, in which information is conveyed to human users via multiple modalities such as voice and hand gestures, and in which the internal representation is modality-independent, and both propositional and non-propositional. When using the term Conversational Agent, for example, one might think of a chatbot, virtual companion, “interface agent, embodied conversational agent, virtual assistant, autonomous agent, [or] avatar…often synonymously” [44 p.1641] and use these labels interchangeably, or so as to articulate particular subtle distinctions. Embodied conversational agents are “specifically conversational in their behaviors, and specifically humanlike in the way they use their bodies in conversation” [9 p.29], though the requirements of such agents are arguably partly transferable to the non-embodied CA. Assessing system intelligence In terms of perceptions of CA intelligence, all except the System feedback and representation of intelligence – recognising humour as an In particular, in the context of Embodied Conversational Agents, they can be used to provide them with semantic knowledge and, therefore, enhance their intellectual skills. In this paper, we propose an approach to explore the synergies between these technologies. Thus, we have developed a multimodal ECA that exploits the knowledge provided by the Linked Data initiative to help users in their search information tasks. Based on a semantic-guided keyword search, our approach is flexible enough to: 1) deal with different Linked Data repositories and 2) handle different search/knowledge domains in ... Cassell J (2001) Embodied conversational agents: representation and intelligence in user interfaces. AI Mag 22 (4):67–84Google Scholar. 13.