

The Role of Information Scent in On-line Browsing: Extensions of the ACT-R Utility and Concept Formation Mechanisms

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The notion of information scent has been used in developing models of people seeking information in document-clustering browsers, highly interactive information visualizations and the World Wide Web. Information scent refers to the detection and use of cues, such as World Wide Web links or bibliographic citations, that provide users with concise information about content that is not immediately available. The information scent cues play an important role in guiding users to the information they seek, and they also play a role in providing users with an overall sense of the contents of collections. In this presentation I will discuss: (a) an ACT model of users seeking information on the Web and (b) an ACT model of concept formation from interaction with on-line document collections.

The first model, SNIF-ACT (Scent-based Navigation and Information Foraging in the ACT architecture) has been developed (with Wai-Tat Fu) to simulate users as they perform unfamiliar information-seeking tasks on the World Wide Web (WWW). SNIF-ACT selects actions based on a measure of information scent that is calculated by a spreading activation mechanism that captures the mutual relevance of the contents of a Web page to the goal of the user. There are two main predictions of SNIF-ACT: (1) users working on unfamiliar tasks are expected to choose links that have high information scent, (2) users will leave a site when the information scent of the site diminishes below a certain threshold. SNIF-ACT produced good fits to data collected from four users working on two tasks each. The results suggest that the current content-based spreading activation SNIF-ACT model is able to generate useful predictions about complex user-WWW interactions.

Users develop internal models of what kinds of documents they expect to find in on-line document collections. For instance, people make guesses about what Web sites to visit to find specific information. Different kinds of browsers or Web site designs may present information cues (e.g., links, category labels) in different ways that will lead users to have different expectations about what can be found at a Web site. The second model, InfoClass (Information Category Learning by Adaptation to Scent Stimuli) builds on the ACT theory of concept formation to address the concepts acquired through browsing. The model has been applied to data from two kinds of browsers and it predicts the conceptual coherence between and within users that arises from interaction.