

# Multimodal Interface Design: A Promising Means of Supporting Attention Management in Healthcare



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In a variety of event-driven domains, such as medicine, attention and interruption management pose major challenges for operators. For example, in a given two-hour period, an emergency department physician may treat as many as 16 patients simultaneously and interact with as many as 132 individuals (MD News, 2011). This has been shown to result in an average of 30.9 interruptions during a 180-minute period (Chisholm et al., 2000). Untimely externally imposed interruptions are known to increase the likelihood of errors, both on the interrupting and the interrupted task. Therefore, it is critical to help physicians make informed decisions about whether to accept or reject a potential interruption and how best to incorporate interrupting tasks into their workflow. Equally important is the need for operators to realize on their own the need and proper time for interrupting an ongoing task to solve a more pressing problem. The challenge is to support these decisions without creating disruptions in the first place. Tactile notifications will be discussed as a promising means of achieving this goal of supporting preattentive reference, effective multitasking and successful attention/interruption management.

**Dr. Nadine Sarter** is a Professor in the Department of Industrial and Operations Engineering and the Center for Ergonomics at the University of Michigan. She received her Ph.D. in Industrial and Systems Engineering, with a specialization in Cognitive Ergonomics/Cognitive Systems Engineering, from Ohio State University in 1994. Dr. Sarter received numerous awards, including the HFES Jerome H. Ely Human Factors Article Award (2008), a TGIR ("Turning Goals Into Reality") Award from NASA-Glenn Research Center (2001), and an NSF Career Award (1998). Her primary research interests include a) the design and evaluation of tactile and multimodal HCI and CSCW interfaces (including sight, sound, and touch), b) support for attention and interruption management through adaptive notifications and preattentive reference, c) the design of decision aids that support trust calibration and adaptive function allocation, and d) human error and error management in a variety of complex domains, including aviation, medicine, the military, and the automotive industry.

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