**Interfaces Designed to Aid Cognition: Two Studies**

Stephen B. Gilbert, Ph.D.
Associate Director, Virtual Reality Applications Center
Human Computer Interaction
Research Assistant Professor, Psychology
Iowa State University

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**Abstract**

This research talk describes evaluations of two interfaces that were designed to increase understanding of complex environments. The first study describes efforts to create software that can be used by non-programmers to create intelligent tutoring systems (ITSs). ITSs have been demonstrated to increase learning, sometimes in reduced time. However, ITSs typically require significant programming experience to create. To facilitate the use of ITSs by non-programmers in multiple domains, the Extensible Problem-Specific Tutor (xPST) was created. Participants in evaluation studies demonstrated that xPST can be used by authors with minimal programming experience to create tutors for 1) 3D game environments, and 2) statistics homework problems. The second study compares three interfaces for displaying 360-degree video in 2D. Metrics include participants' ability to accurately estimate the angle between themselves and objects in an environment (self-to-object) and their ability to estimate relationships between objects in the environment (object-to-object). Results suggest 1) non-seamless interfaces with visual boundaries facilitate spatial understanding, 2) correct perception of self-to-object relationships is not correlated with understanding object-to-object relationships within the environment, and 3) increased video game experience corresponds with better spatial understanding of an environment observed in 360-degrees.

**Education**

Massachusetts Institute of Technology, Ph. D., 1997
Princeton University, B.S.E., 1992

**Research Interests**

Intelligent Tutoring Systems, Multitouch haptic interfaces, Usability, Interface design, Instructional design, Educational technologies, Human-computer interaction