

Robert R. Hoffman, Ph.D.

Topic: Macrocognition: Perspective, Methodology and Metrics

Abstract: The distinction between microcognition and macrocognition first appeared in the mid-1980s in Cognitive Systems Engineering (European ergonomics) for industrial process control. Currently, it is emerging as a topic of interest in the communities of practice known as Naturalistic Decision Making and Cognitive Systems Engineering, especially with regard to issues of measurement and the effectiveness of human-machine systems. Macrocognition is: (a) a viewpoint for understanding cognitive work in complex sociotechnical contexts, (b) a set of methodological presuppositions, and (c) a set of premises that place Cognitive Field Research in contrast with traditional experimentation of the psychology laboratory. Primarily because of this latter feature, the notion of macrocognition has generated controversy. This presentation will introduce the basic of premises and concepts of macrocognition and explain the philosophical contrasts ("isms") that lie at the core of the micro-macro distinction. The presentation will culminate with some ideas about how macrocognitive notions might reach into the realm of measurement theory. Specifically, macrocognition provides an ontology for the measurement postulates in a Theory of Complex Cognitive Systems.

Biography: Hoffman is a Senior Research Scientist at the Institute for Human and Machine Cognition in Pensacola FL. He is a Fellow of the American Psychological Society, a Fulbright Scholar, and an Honorary Fellow of The Eccles Center for American Studies of the British Library. He received his B.A., M. A., and Ph.D. in experimental psychology at the University of Cincinnati, where he received McMicken Scholar, Psi Chi, and Delta Tau Kappa Honors. After a Postdoctoral Associateship at the Center for Research on Human Learning at the University of Minnesota, Hoffman joined the faculty of the Institute for Advanced Psychological Studies at Adelphi University. Hoffman has been recognized internationally in disciplines including psychology, remote sensing, weather forecasting, and artificial intelligence, for his research on human factors in remote sensing, terrain analysis, and weather forecasting, for his work in the psychology of expertise, the methodology of knowledge elicitation, and for his work on the human factors issues in the design of workstation systems, interfaces, and knowledge-based systems. Hoffman is Editor for the Department on Human-Centered Computing in IEEE: Intelligent Systems, and is Editor for the book Series, "Expertise: Research and Applications." His major current project involves an effort to define the principles and methodologies for human-centered computing and cognitive technologies. He is also helping lead an effort to establish a National Alliance for Expertise Studies. His latest books are "Working Minds: A Practitioner's Handbook of Cognitive Task Analysis," "Expertise Out of Context," "Minding the Weather: How Expert Forecasters Think," and "The Cambridge Handbook of Expertise and Expert Performance."