



Informed by Knowledge: Expert Performance in Complex Situations (Expertise: Research and Applications Series)

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The focus of this book is on how experts adapt to complexity, synthesize and interpret information in context, and transform or "fuse" disparate items of information into coherent knowledge. The chapters examine these processes across experts (e.g. global leaders, individuals in extreme environments, managers, police officers, pilots, commanders, doctors, inventors), across contexts (e.g. space and space analogs, corporate organizations, command and control, crisis and crowd management, air traffic control, the operating room, product development), and for both individual and team performance. Successful information integration is a key factor in the success of diverse endeavors, including team attempts to climb Mt. Everest, crowd control in the Middle East, and remote drilling operations.

This volume is divided into four sections, each with a specific focus on an area of expert performance, resulting in a text that covers a wide range of useful information. These sections present well-researched discussions, such as: the management of complex situations in various fields and decision contexts; technological and training approaches to facilitate knowledge management by individual experts and expert teams; new or neglected perspectives in expert decision making; and the importance of 'modeling' expert performance through techniques and frameworks such as Cognitive Task Analysis, computational architectures based on the notion of causal belief mapping such as 'Convince Me,' or the data/frame model of sensemaking.

The volume provides essential reading for researchers and practitioners of Naturalistic Decision Making and those who study Expertise; Organizational and Cognitive Psychologists; and researchers and students in Business and Engineering.

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Editorial Review

Review

"Informed by Knowledge, edited by Mosier and Fischer, two highly respected researchers in both the NDM and wider community, highlights the importance of information synthesis for decision making. The contributions from other authors cover key areas of research and raise pertinent questions, making this a book which should be kept readily to hand on your desk. It is a must for anyone interested in current decision making research." - **Margaret Crichton, Ph.D., People Factor Consultants Ltd., UK**

"For some 20 years the series of conferences on Naturalistic Decision Making have been influential in shaping the future research agenda of cognitive engineering and human factors. This timely volume, collecting and integrating research presented at the most recent such conference, promises to continue this venerable tradition. We read and hear so much these days about failures of even our best experts and elite organizations to 'connect the dots.' Much of the work reported here, skillfully compiled and edited by Mosier and Fischer, helps us understand why this is, and even more importantly, provides concrete steps to address these problems. This volume couldn't come at a better time to a world where the difference between success and failure increasingly lies in an ability to effectively cope with complexity and uncertainty." - **Alex Kirlik, Ph.D., University of Illinois at Urbana-Champaign, USA**

"Drs. Mosier and Fischer have amassed an excellent collection of two dozen articles from well respected authors covering topics such as managing complexity, technology support and training for knowledge management, and overlooked issues in expert decision making. The latter topic area features one of my favorites, a superb thought provoking paper on 'Anticipatory Thinking,' by Klein, Snowden, and Pin. Another jewel among this string of pearls is Cohen's paper entitled, Knowns, Known Unknowns, and Unknown Unknowns: Time and Uncertainty in Naturalistic Decision Making. As always Dr. Cohen presents some deep thinking on how experts manage time. Presented here is a cadre of informative and engaging papers on current cognitive psychological topics." - **Elliot E. Entin, Senior Scientist, Aptima, Inc., USA**

About the Author

Dr. Kathleen L. Mosier received her Ph.D. in Organizational Psychology from the University of California, Berkeley, in 1990. From 1990-1997 she was a Senior Research Scientist at NASA Ames Research Center and moved to San Francisco State University in Fall, 1997. Her research focus and areas of expertise include decision making in applied contexts, particularly aviation, human-automation interaction in decision making, and the impact of affective state on decision processes. Dr. Mosier is the 2009-2010 President of the Human Factors and Ergonomics Society, a founding member and officer of the Cognitive Engineering and Decision Making Technical Group, and Associate Editor of the *Journal of Cognitive Engineering and Decision Making*. She is also past President of the Association for Aviation Psychology.

Dr. Ute M. Fischer received a Ph.D. in Cognitive Psychology from Princeton University in 1990. In 1991 she was awarded an NRC/NAS post-doctoral fellowship at NASA Ames Research Center, and subsequently joined its Human Factors Division as a Senior Research Scientist. Since moving to Atlanta in 1995, she has been a research scientist in the School of Literature, Communication and Culture at the Georgia Institute of Technology. Research activities and areas of expertise include communication and decision making

processes of professionals and teams in complex, high-technology environments, in particular in aviation and space and the role of cognitive, social, environmental and organizational factors in distributed decision making.

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