

Preface

The contents of this book address the problem of how we should deploy the power available through developments in computational technology (e.g., object oriented programming, experts systems, natural language interfaces) to assist human performance in complex problem solving worlds, i.e., cognitive engineering. Effective use of computational power depends on understanding the problems to be solved and how people solve and fail to solve these problems. This understanding will lead to principle driven, rather than technology only driven, development of computational possibilities for intelligent and effective decision support, and can affect the very nature of the computational tools that are needed (e.g., techniques for reasoning about uncertainty; semantic reasoning engines).

The book contains a series of papers by a collection of international researchers (17 authors from eight countries) that address a wide range of fundamental questions in cognitive engineering such as: what should be the relationship between the machine and human portions of a human-machine problem solving ensemble? How do people use today's support systems? What are the sources of performance failures in complex systems? What support do people need to function more expertly? How can machine reasoning help construct support systems for complex and dynamic worlds? Where do we need to extend machine reasoning capabilities to cope with the demands of complex and dynamic worlds?

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