ARTIFICIAL INTELLIGENCE, SIMULATION, AND MODELING

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Kenneth A. Loparo
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PREFACE

This book is the product of a very typical phenomenon in scientific circles—the chance remark or encounter that leads to a whole sequence of events. In our case, a chance remark at a bull session one Sunday in the Spring of 1986 led to the assembly of this book.

David Helman and Lawrence Widman were ruminating on the state of the world when David noticed an announcement for the first Workshop on AI and Simulation to be held in conjunction with the Fifth National Conference on Artificial Intelligence in Philadelphia. David had just signed a contract to edit an interdisciplinary book in the fields of artificial intelligence, cognitive science, and philosophy. He suggested that Larry undertake the editing of a similar book related to AI and simulation. One thing led to another, and David and Larry attended the workshop. A sample of speakers, whose work might form the framework of a review of the nascent field of AI and simulation, were consulted. Each of the potential contributors responded favorably to the invitation, and the germ of an idea began to grow.

Ken Loparo was invited to join the venture and the search for a publisher undertaken. The goals and structure of the book were established, contributors identified, invitations extended, and the book began to take shape. The publisher introduced Norman Nielsen to the editors. His insights proved to be so helpful that he was invited to become a co-editor when for reasons of time David's interests were drawn away last year.

The field of AI has much to offer the world of simulation, and vice versa. Accordingly, we have organized the contributions in this book to address both points of view, examining the field from the perspective of

- traditional simulationists who seek greater representational flexibility and ease of use which AI techniques can provide and
- computer scientists with a symbolic computing background who seek greater power and realism which rigorous simulation techniques can provide.

To this end, we have divided the book into three parts. The first part contains eight chapters that discuss the theoretical underpinnings of AI and simulation. The second part contains three chapters that discuss the application of simulation techniques to current research problems in AI, while the third part contains eight chapters that discuss the application of AI methods to the needs of simulationists and simulation users.

In designing and assembling this book, we have assumed a broad audience with interests ranging from AI to simulation and experience ranging from little to extensive. Accordingly, we have included a fairly comprehensive introductory chapter that that seeks to provide a framework for the remaining 19 chapters. It provides

- a brief history of AI and of simulation,
- a concise introduction to the basic concepts of each discipline,
- a survey of the current literature related to the intersection of these two disciplines, and
- an introduction to each of the book's parts and the chapters therein.

Many people have contributed to the development of this book over the two years that it has been in gestation. First and foremost, of course, are the authors, without whose contributions this book would not have been possible. They were a marvelous group to work with, and we owe them a special debt of gratitude. Not only have they patiently borne our requests for repeated revisions, but they have modified their manuscripts in order to achieve a degree of uniformity in the scope and depth of the material presented.

Credit must also be given to Professor David Helman of Case Western Reserve University. Not only did he plant the seed that gave rise to this book, but he nurtured the emerging seedling as well. Truly, his spirit is imprinted on this book.

Finally, we would like to credit our editor, Diane Cerra, Wanda Cuevas, Jenet McIver, Robert Hilbert, and the entire Wiley team. Not only did they have faith in our vision of what one day might become a book, but they actively guided and supported us in that endeavor.

May you enjoy the fruits of everyone's labors and find that the material is of assistance to you in understanding the growing field of AI and simulation and in carrying out your work.

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