FUZZY LOGIC

A PRACTICAL APPROACH

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Dedication of this book is to the memory of Merrill Meeks Flood, Ph.D. To the extent that the fact of existence is magic, he personified that magic.

—FMM

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FOREWORD

The last decade has seen a large interest in technologies that have as their motivation some aspect of human function. Some of these, like artificial intelligence, can be seen to be rooted in the psychological domain. Others, like neural networks, genetic algorithms, and evolutionary programming, are inspired by reconsiderations of biological processes. Common to all these so-called "intelligent technologies" is a need to represent knowledge in a manner that is both faithful to the human style of processing information as well as a form amenable to computer manipulation.

Fuzzy sets were originally introduced in 1965; the related discipline of fuzzy logic is proving itself as the most appropriate medium to accomplish this task. At one level, fuzzy logic can be viewed as a language that allows one to translate sophisticated statements from natural language into a mathematical formalism. Once we have this mathematical form of knowledge, we are able to draw upon hundreds of years of recent history in technology to manipulate this knowledge.

While the original motivation was to help manage the pervasive imprecision in the world, the early practitioners of fuzzy logic dealt primarily with theoretical issues. Many early papers were devoted to basic foundations and to "potential" applications. This early phase was also marked by a strong need to distinguish fuzzy logic from probability theory. As is well understood now, fuzzy set theory and probability theory are directed at different types of uncertainty. The next phase of the development of the discipline was

driven by the success, particularly in Japan, of using fuzzy logic to design simple controllers. This success has sparked a worldwide interest in using this technology for the construction of complex systems models in engineering disciplines.

With the publication of this book we are beginning to see the emergence of the next phase of fuzzy logic. During this phase we will see the opening of the power of this methodology to middle-level "technocrats." In addition, the focus of this book, rather than being strictly on engineering problems, provides a number of broader applications. The authors are to be complimented on providing a book that will be very useful to those who desire to use fuzzy logic to solve their problems. The book has many examples and complementary software to help the novice.

I look forward to a future in which the techniques of fuzzy logic will become as pervasive on desktop computers as spreadsheets and databases. The authors of this book have taken an important step in helping realize this future.

Ronald R. Yager
New York
June 1994

FILE INSTALLATION PROCEDURE

The files are in compressed form on the disk and will be expanded automatically during the installation procedure.

1. With Windows active, click on the **instalit.exe** file.

2. A Dialog box will ask you if you want to proceed with the installation. Click on OK.

3. A dialog box will ask whether the default directory is Ok. Click on OK.

4. Installation will proceed, placing the files in the **fuztools** program group.

5. Open any file by double- clicking on its icon.