II APPLICATIONS OF FUZZY SET THEORY

Applications of fuzzy set theory can already be found in many different areas. One could probably classify those applications as follows:

1. Applications to mathematics, that is, generalizations of traditional mathematics such as topology, graph theory, algebra, logic, and so on.
2. Applications to algorithms such as clustering methods, control algorithms, mathematical programming, and so on.
3. Applications to standard models such as "the transportation model," "inventory control models," "maintenance models," and so on.
4. Finally, applications to real-world problems of different kinds.

In this book, the first type of "applications" will be covered by looking at fuzzy logic and approximate reasoning. The second type of applications will be illustrated by considering fuzzy clustering, fuzzy linear programming, and fuzzy dynamic programming. The third type will be covered by looking at fuzzy versions of standard operations research models and

at multicriteria approaches. The fourth type, eventually, will be illustrated on the one hand by describing operations research (OR) models as well as empirical research in chapter 15. On the other hand, chapter 10 has entirely been devoted to fuzzy control and expert systems, the area in which fuzzy set theory has probably been applied to the largest extent and also which is closest to real applications. This topic is treated in still more detail in the second volume of this book [Zimmermann 1987].