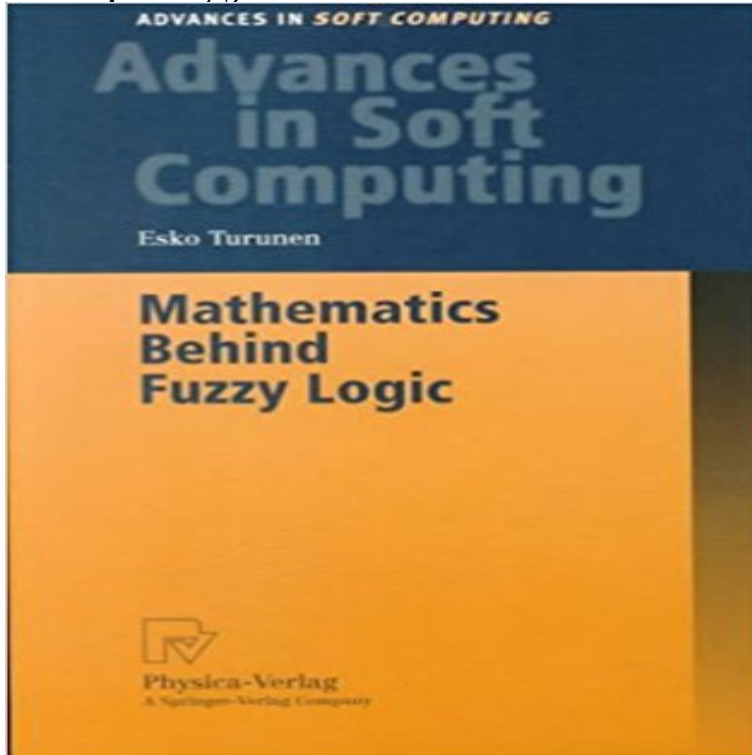


Mathematics Behind Fuzzy Logic (Advances in Intelligent and Soft Computing)



Many results in fuzzy logic depend on the mathematical structure the truth value set obeys. In this textbook the algebraic foundations of many-valued and fuzzy reasoning are introduced. The book is self-contained, thus no previous knowledge in algebra or in logic is required. It contains 134 exercises with complete answers, and can therefore be used as teaching material at universities for both undergraduated and post-graduated courses. Chapter 1 starts from such basic concepts as order, lattice, equivalence and residuated lattice. It contains a full section on BL-algebras. Chapter 2 concerns MV-algebra and its basic properties. Chapter 3 applies these mathematical results on Lukasiewicz-Pavelka style fuzzy logic, which is studied in details; besides semantics, syntax and completeness of this logic, a lot of examples are given. Chapter 4 shows the connection between fuzzy relations, approximate reasoning and fuzzy IF-THEN rules to residuated lattices.

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