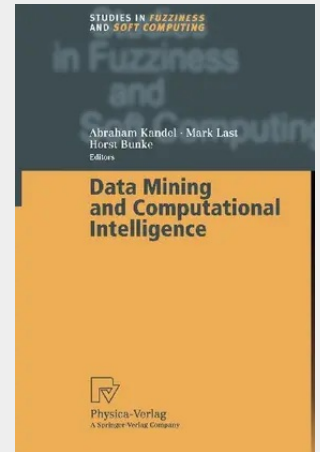


## Data Mining and Computational Intelligence

Many business decisions are made in the absence of complete information about the decision consequences. Credit lines are approved without knowing the future behavior of the customers; stocks are bought and sold without knowing their future prices; parts are manufactured without knowing all the factors affecting their final quality; etc. All these cases can be categorized as decision making under uncertainty. Decision makers (human or automated) can handle uncertainty in different ways. Deferring the decision due to the lack of sufficient information may not be an option, especially in real-time systems. Sometimes expert rules, based on experience and intuition, are used. Decision tree is a popular form of representing a set of mutually exclusive rules. An example of a two-branch tree is: if a credit applicant is a student, approve; otherwise, decline. Expert rules are usually based on some hidden assumptions, which are trying to predict the decision consequences. A hidden assumption of the last rule set is: a student will be a profitable customer. Since the direct predictions of the future may not be accurate, a decision maker can consider using some information from the past. The idea is to utilize the potential similarity between the patterns of the past (e.g., "most students used to be profitable") and the patterns of the future (e.g., "students will be profitable").

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**160,49 €**

149,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

**Artikelnummer:** 9783790824841

**Medium:** Buch

**ISBN:** 978-3-7908-2484-1

**Verlag:** Physica

**Erscheinungstermin:** 21.10.2010

**Sprache(n):** Englisch

**Auflage:** 1. Auflage. Softcover version of original hardcover Auflage 2001

**Serie:** Studies in Fuzziness and Soft Computing

**Produktform:** Kartoniert

**Gewicht:** 563 g

**Seiten:** 356

**Format (B x H):** 155 x 235 mm

