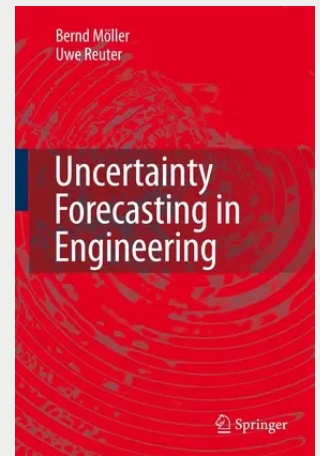


Uncertainty Forecasting in Engineering

Forecasting is fascinating. Who wouldn't like to cast a glimpse into the future? Far removed from metaphysics, mathematical methods such as time-lapse techniques, time series or artificial neural networks offer a rational means of achieving this. A precondition for the latter is the availability of a sequence of observed values from the past whose temporal classification permits the deduction of attributes necessary for forecasting purposes. The subject matter of this book is uncertain forecasting using time series and neural networks based on uncertain observed data. 'Uncertain' data - plies information exhibiting inaccuracy, uncertainty and questionability. The uncertainty of individual observations is modeled in this book by fuzziness. Sequences of uncertain observations hence constitute fuzzy time series. By means of new discretization techniques for uncertain data it is now possible to correctly and completely retain data uncertainty in forecasting work. The book presents numerical methods which permit successful forecasting not only in engineering but also in many other fields such as environmental science or economics, assuming of course that a suitable sequence of observed data is available. By taking account of data uncertainty, the indiscriminate reduction of uncertain observations to real numbers is avoided. The larger information content described by uncertainty is retained, and compared with real data, provides a deeper insight into causal relationships. This in turn has practical consequences as far as the fulfillment of technical requirements in engineering applications is concerned.

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