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| Nota di contenuto | Introduction -- Generalized Type-2 Fuzzy Logic -- Edge Detection Methods and Filters Used on Digital Image Processing -- Metrics for Edge Detection Methods -- Edge Detection Methods Based on Generalized Type-2 Fuzzy Logic Systems -- Generalized Type-2 Fuzzy Edge Detection Applied on a Face Recognition System -- Experimentation and Results Discussion -- Conclusions. |
| Sommario/riassunto | In this book four new methods are proposed. In the first method the generalized type-2 fuzzy logic is combined with the morphological gra-dient technique. The second method combines the general type-2 fuzzy systems (GT2 FSs) and the Sobel operator; in the third approach the me-thodology based on Sobel operator and GT2 FSs is improved to be applied on color images. In the fourth approach, we proposed a novel edge detec-tion method where, a digital image is converted a generalized type-2 fuzzy image. In this book it is also included a comparative study of type-1, inter-val type-2 and generalized type-2 fuzzy systems as tools to enhance edge detection in digital images when used in conjunction with the morphologi-cal gradient and the |

Sobel operator. The proposed generalized type-2 fuzzy edge detection methods were tested with benchmark images and synthetic images, in a grayscale and color format. Another contribution in this book is that the generalized type-2 fuzzy edge detector method is applied in the preprocessing phase of a face rec-ognition system; where the recognition system is based on a monolithic neural network. The aim of this part of the book is to show the advantage of using a generalized type-2 fuzzy edge detector in pattern recognition applications. The main goal of using generalized type-2 fuzzy logic in edge detec-tion applications is to provide them with the ability to handle uncertainty in processing real world images; otherwise, to demonstrate that a GT2 FS has a better performance than the edge detection methods based on type-1 and type-2 fuzzy logic systems.