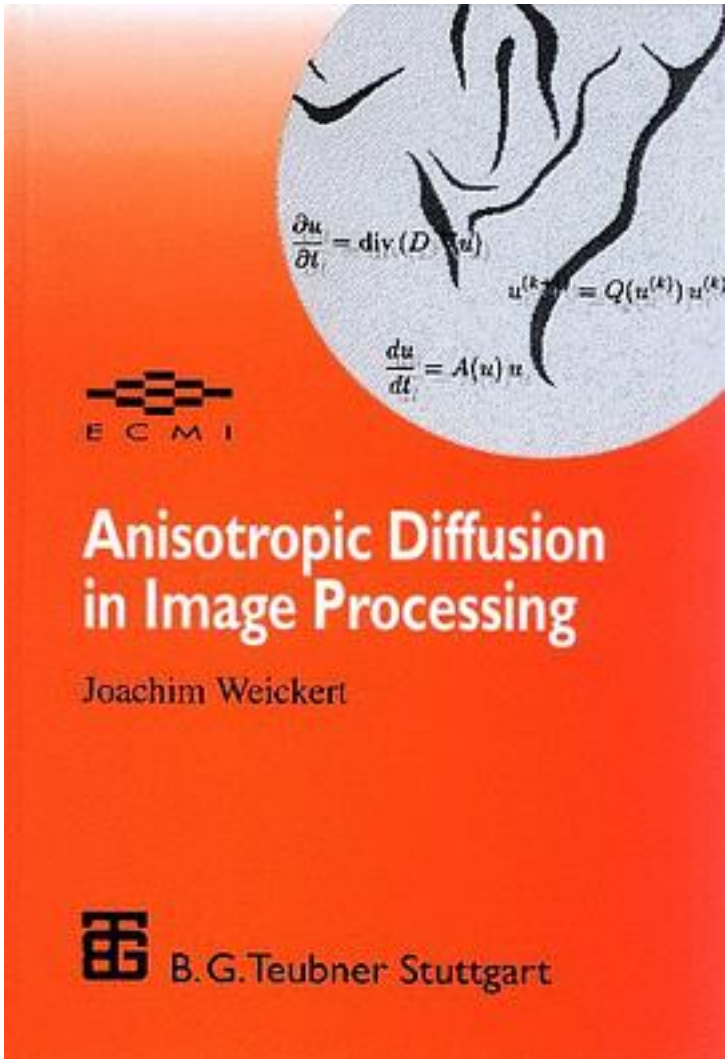
Anisotropic diffusion in image processing



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著者:(German) Turtleback

出版者:Teubner (1998)

出版时间:1998

装帧:平装

isbn:9783519026068

Many recent techniques for digital image enhancement and multiscale image representations are based on nonlinear partial differential equations (PDEs).

This book gives an introduction to the main ideas behind these methods, and it describes in a systematic way their theoretical foundations, numerical aspects, and applications. A large number of references enables the reader to acquire an up-to-date overview of the original literature.

The central emphasis is on anisotropic nonlinear diffusion filters. Their flexibility allows to combine smoothing properties with image enhancement qualities. A general framework is explored covering well-posedness and scale-space results not only for the continuous, but also for the algorithmically important semidiscrete and fully discrete settings. The presented examples range from applications in medical image analysis to problems in computer aided quality control.

作者介绍:

Joachim Weickert is a German professor of mathematics and computer science at Saarland University. In 2010, Weickert won the Gottfried Wilhelm Leibniz Prize for his work in image processing.[1][2]

Weickert did his undergraduate studies at the University of Kaiserslautern and then stayed there as a graduate student, earning his doctorate in mathematics in 1996 under the supervision of Helmut Neunzert; his dissertation was entitled Anisotropic diffusion in image processing.[3] After taking postdoctoral research positions at the University of Utrecht and the University of Copenhagen, he became an assistant professor at the University of Mannheim, and earned a habilitation degree there in 2001. In 2002, he took a faculty position as a full professor at Saarland University.[4]

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