

1. Record Nr.	UNINA9910823948103321
Autore	Qiu Peihua <1965->
Titolo	Image processing and jump regression analysis // Peihua Qiu
Pubbl/distr/stampa	Hoboken, N.J., : John Wiley, c2005
ISBN	9786610276851 9781280276859 1280276851 9780470356869 0470356863 9780471733157 0471733156 9780471733164 0471733164
Edizione	[1st ed.]
Descrizione fisica	1 online resource (340 p.)
Collana	Wiley series in probability and statistics
Disciplina	006.3/7
Soggetti	Image processing Regression analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"Wiley-Interscience."
Nota di bibliografia	Includes bibliographical references (p. 281-300) and index.
Nota di contenuto	Image Processing and Jump Regression Analysis; Contents; List of Figures; List of Tables; Preface; 1 Introduction; 1.1 Images and image representation; 1.1 A conventional coordinate system for expressing an image in industry.; 1.2 Regression curves and sugaces with jumps; 1.2 A log-transformed C-band, HH-polarization, synthetic aperture radar image of an area near Thetford forest, England.; 1.3 December sea-level pressures observed by a Bombay weather station in India during 1921-1992.; 1.3 Edge detection, image restoration, and jump regression analysis 1.4 Statistical process control and some other related topics1.5 Organization of the book; Problems; 2 Basic Statistical Concepts and Conventional Smoothing Techniques; 2.1 Introduction; 2.2 Some basic statistical concepts and terminologies; 2.2.1 Populations, samples, and distributions; 2.1 Probability density curve of the standard normal

distribution.; 2.2.2 Point estimation of population parameters; 2.2.3 Confidence intervals and hypothesis testing; 2.2.4 Maximum likelihood estimation and least squares estimation; 2.3 Nadaraya- Watson and other kernel smoothing techniques  
 2.3.1 Univariate kernel estimators 2.3.2 Some statistical properties of kernel estimators; 2.3.3 Multivariate kernel estimators; 2.4 Local polynomial kernel smoothing techniques; 2.4.1 Univariate local polynomial kernel estimators; 2.4.2 Some statistical properties; 2.2 The Nadaraya-Watson (NW) kernel estimator and the local linear kernel (LK) estimator.; 2.3 Behavior of the Nadaraya-Watson (NW) kernel estimator [plot (a)] and the local linear (LK) kernel estimator [plot (b)] of; 2.4.3 Multivariate local polynomial kernel estimators  
 2.4 Behavior of the Nadaraya- Watson (NW) kernel estimator [plot (a)] and the local linear kernel (LK) estimator [plot (b)] o 2.4.4 Bandwidth selection; 2.5 Spline smoothing procedures; 2.5.1 Univariate smoothing spline estimation; 2.5.2 Selection of the smoothing parameter; 2.5.3 Multivariate smoothing spline estimation; 2.5.4 Regression spline estimation; 2.5 Four B-splines when  $t_i, t_{j+1}, t_{j+2}, t_{j+3}$ , and  $t_{j+4}$  are 0, 0.25, 0.5, 0.75, and 1.0.; 2.6 Wavelet transformation methods; 2.6.1 Function estimation based on Fourier transformation; 2.6.2 Univariate wavelet transformations  
 2.6 The Haar father wavelet, the Haar mother wavelet, the Haar wavelet function  $y_{1,0}$ , and the Haar wavelet function  $y_{1,1}$ . 2.6.3 Bivariate wavelet transformations; Problems; 2.7 When  $f(x)$  and  $y(x)$  are the Haar father and mother wavelets, the two-dimensional wavelet functions  $F(x, y)$ ,  $Y(1)(x, y)$ ,  $Y(2)(x, y)$ , and  $Y(3)(x, y)$  are displayed.; 3 Estimation of Jump Regression Curves; 3.1 Introduction; 3.2 Jump detection when the number of jumps is known; 3.2.1 Difference kernel estimation procedures  
 3.1 The true regression function  $f$  and the jump detection criterion MDKE defined by expression (3.2) when  $c = 0, n = 100$ , and  $h_n = 0.1$ .

## Sommario/riassunto

The first text to bridge the gap between image processing and jump regression analysis Recent statistical tools developed to estimate jump curves and surfaces have broad applications, specifically in the area of image processing. Often, significant differences in technical terminologies make communication between the disciplines of image processing and jump regression analysis difficult. In easy-to-understand language, Image Processing and Jump Regression Analysis builds a bridge between the worlds of computer graphics and statistics by addressing both the connections and the d