Institute of Statistics

STAT3120   Advanced nonparametric statistics

[30h] 6 credits

This course is taught in the 2nd semester

Teacher(s):   Christian Hafner, Rainer von Sachs
Language: English
Level: Third cycle

Aims

This course makes you familiar with the different basic techniques used in nonparametric curve estimation (of fixed and stochastic design regression functions, densities and spectral densities).

Main themes

You will learn how to use estimation methods based on kernels, smoothing splines, local polynomials and wavelets. You will describe and compare these methods by different criteria such as the mean square error, including bias and variance of the estimator. You will develop a profound understanding of these methods by applying them to the aforementioned variety of different domains of nonparametric curve estimation.

Content and teaching methods

The table of content of this course will be adapted towards the interests and background of the students. We will start by a series of more theoretical lectures which are followed by presentations prepared by you on a summary of some original research paper related to the topic treated.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

References
BOSQ, D et J.-P. LECOUTRE (1987) : Théorie de l'estimation fonctionnelle. Economica, Paris
SILVERMAN, B.W. (1986) : Density Estimation for Statistics and Data Analysis. Chapman and Hall, London.
HARDLE, W. (1990) : Applied Nonparametric Regression. Cambridge University Press, Cambridge.
OGDEN, T. (1997) : Essential wavelets for statistical applications and data analysis. Birkhäuser, Boston.
MALLAT, S. (1999): A wavelet tour of signal processing. 2 ed. AP, London.
GIJBELS, I. : Advanced nonparametric statistics. Syllabus du cours STAT 3120.
SIMONOFF, J.S. (1996). Smoothing methods in Statistics. Springer.
WAND, M.P. et JONES, M.C. (1995). An introduction to kernel smoothing.Chapman and Hall,London.

Other credits in programs

STAT3DA/E	diplôme d'études approfondies en statistique (statistique et économétrie)	(6 credits)	
STAT3DA/M	Diplôme d'études approfondies en statistique (méthodologie de la statistique)	(6 credits)	Mandatory
STAT3DA/P	diplôme d'études approfondies en statistique (pratique de la statistique)	(6 credits)	