University of Colorado - Department of Economics
Econ 8828 - Advanced Econometrics 1 (3 credits)
Professor Carlos Martins-Filho

Office. Economics Building 105

Meetings. Tuesdays and Thursdays from 9:30 AM - 10:45 AM in Economics Building 5.

Office hours. Thursdays 3:30 PM - 5:30 PM and by appointment. For appointment send an email to carlos.martins@colorado.edu.

Class URL. http://spot.colorado.edu/ martinsc/ECON_8828.html

Prerequesites. ECON 7828 (or equivalent) or consent of instructor.

Objectives. 1) Have advanced knowledge of estimation and inference methods used for nonparametric statistical models. 2) Be able to program and implement the various estimators and test procedures discussed in class.

Grades. Your course grade depends on homework sets a final examination and a research project. The research project is a 10 to 15 page long research proposal. It should include an introduction that convinces the reader of the relevance of your research/contribution, a review of the relevant literature, and if applicable, the methodology to be used. Relevant dates are given below.

Evaluation	Points	Date
Homework sets	40	TBA in class
Project	30	due 12.2.10 by 3:00 PM
Final	30	12.15 from 4:30 PM - 7:00 PM

Textbooks.

1. Bosq, D., 1998, Nonparametric Statistics for Stochastic Processes, Springer-Verlag, New York.
2. Li, Q. and J. S. Racine, 2007, Nonparametric Econometrics: Theory and Practice, Princeton University Press, Princeton.
3. Pagan, A. and A. Ullah, 1999, Nonparametric Econometrics, Cambridge University Press, Cambridge.
4. Fan, J. and Q. Yao, 2003, Nonlinear Time Series, Springer Verlag, New York.
5. I will distribute class notes. Read them carefully. They reflect my view of the most important concepts/theorems we cover in the course.

Support and Reference Books.

A. Mathematics, Probability, Statistics and Asymptotic Theory

1. Apostol, T., 1974, Mathematical Analysis, Addison Wesley, New York.
2. Bartle, R., 1966, Elements of Integration, John Wiley and Sons, New York.
3. Davidson, J., 1994, Stochastic Limit Theory, Oxford University Press, Oxford.

2.3 Finite Sample and Asymptotic Properties
2.3.1 Under IID Assumptions
2.3.2 Under Mixing Assumptions
2.4 Bandwith choice
2.5 Selected Applications and Implementation *via* GAUSS.

3. Additive Models of Regression

2.1 The back tting estimation
2.2 Marginal integration estimation
2.3 A brief introduction to splines
2.4 The spline back tted kernel Estimator
2.5 Asymptotic properties and oracle e ciency

4. Variance estimation

4.1 Residual based local linear estimation
4.2 Residual based local exponential estimation
4.3 Parametric estimation based on nonparametric residuals

5. Selected topics in Nonparametric and Semi-Parametric Modeling

5.1 Nonparametric Frontier Estimation
5.2 Local Likelihood Estimation
5.3 Semiparametric models for regression
5.4 Two-Stage Estimation

The articles listed below are either original formulations of the topics or models described in class or seminal contributions that help the understanding of the topics under study. I will refer to them in class in various occasions.

1. Aigner, D., C. A. K. Lovell and P. Schmidt, 1977, Formulation and estimation of stochastic frontiers production function models. Journal of Econometrics, 6, 21-37.

2. Buja, A., T. Hastie and R. Tibshirani, 1989, Linear Smoother and Additive Models, Annals of Statistics, 17, 453-555.

3. Fan, J., 1992, Design adaptive nonparametric regression. Journal of the American Statistical Association, 87, 998-1004.

4. Fan, Y., Q. Li and A. Weersink, 1996, Semiparametric estimation of stochastic production frontier models. Journal of Business and Economic Statistics, 14, 460-468.

5.

8. Kim, W., O. Linton, N. Hengartner, 1999, A Computationally E cient Oracle Estimator for Additive Nonparametric Regression with Bootstrap Con dence Intervals, Journal of Computational and Graphical Statistics, 8, 278-297.

9. Linton, O. B. and J.P. Nielsen, 1995, A Kernel Method for Estimating Structured Nonparametric Regression based on Marginal Integration, Biometrika, 82, 93-100.

10.

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