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

Prerequisites. 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.

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Points</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework sets</td>
<td>40</td>
<td>TBA in class</td>
</tr>
<tr>
<td>Project</td>
<td>30</td>
<td>due 12.2.10 by 3:00 PM</td>
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<tr>
<td>Final</td>
<td>30</td>
<td>12.15 from 4:30 PM - 7:00 PM</td>
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Textbooks.


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


B. Nonparametric Methods

C. Computer Software

Topics.

1. Univariate and Multivariate Density Estimation
   1.1 An overview
   1.2 The Rosenblatt kernel estimator and its properties
      1.2.1 Under IID assumptions
      1.2.2 Under mixing assumptions
   1.3 Bandwidth choice: an introduction to cross-validation and plug-in methods
   1.4 Some variations on the basic estimator

2. Nonparametric Regression Estimation
   2.1 The Nadaraya-Watson estimator
   2.2 The Local Polynomial estimator
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 backfitting estimation
2.2 Marginal integration estimation
2.3 A brief introduction to splines
2.4 The spline backfitted kernel Estimator
2.5 Asymptotic properties and oracle efficiency

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.


