课程大纲

统计学研究专题三

课程编号：02817100　　授课对象：学术研究生
学　　分：2　　任课教师：宋晓军
课程类型：选修　　开课学期：2015 年秋
先修课程：计量经济学和统计学

任课教师简历（500 字左右）：

宋晓军，北京大学光华管理学院商务统计与经济计量系助理教授。2014 年毕业于马德里卡洛斯三世大学经济系，获经济学博士学位。研究方向是理论计量经济学和应用计量经济学。主要的研究领域包括计量经济学理论，非参数与半参数方法，模型设定检验，自助方法，时间序列分析等。

任课教师联系方式：
电话 01062754839 邮箱 sxj@gsm.pku.edu.cn

助教姓名及联系方式：
李硕 学号 1201110921 电话 15652969857 邮箱 lishuo2012@pku.edu.cn

辅导、答疑时间：TBA

一、项目培养目标

1 **Learning Goal 1** Graduates will be thoroughly familiar with the specialized knowledge and theories required for the completion of academic research.
   - 1.1 Objective 1 Graduates will have a deep understanding of basic knowledge and theories in their specialized area.
   - 1.2 Objective 2 Graduates will be familiar with the latest academic findings in their specialized area and will be knowledgeable about related areas.
   - 1.3 Objective 3 Graduates will be familiar with research methodologies in their specialized area, and will be able to apply them effectively.

2 **Learning Goal 2** Graduates will be creative scholars, who are able to write and publish high-quality graduation dissertation and research papers.
   - 2.1 Objective 1 Graduates will write and publish high-quality graduation dissertation and research papers
   - 2.2 Objective 2 Graduates will be critical thinkers and innovative problems solvers.

3 **Learning Goal 3** Graduates will have a broad vision of globalization and will be able to communicate and cooperate with international scholars
   - 3.1 Objective 1 Graduates will have excellent oral and written communication skills
   - 3.2 Objective 2 Graduates will be able to conduct efficient academic communication in at least one foreign language

4 **Learning Goal 4** Graduates will be aware of academic ethics and will have a sense of social responsibility.

4.1 Objective 1 Graduates will have a sense of social responsibility.

4.2 Objective 2 Graduates will be aware of potential ethical issues in their academic career.

4.3 Objective 3 Graduates will demonstrate concern for social issues.

二、课程概述

This course will introduce you to flexible statistical methods for the analysis of economic data, namely nonparametric and semiparametric methods in econometrics and statistics.

三、课程目标

The main things you will learn in this course are how the nonparametric and/or semiparametric methods work, their usage, and their properties. We will also cover resampling methods and quantile regression.

四、内容提要及学时分配

0. **Introduction to nonparametrics (week 1):**

What is nonparametric estimation?

Interest, main features and some simple methods

1. **Density Estimation (week 2-3):**

CDF estimation

Kernel estimator

Choice of bandwidth

Other aspects: kernel choice, boundary effect

Multivariate density: curse of dimensionality

2. **Regression Estimation (week 4-5):**

Kernel estimator: properties

Choice of bandwidth

Local polynomial estimator

Other methods: series estimators, smoothing splines

3. **Bootstrap (week 6-7):**

Naïve bootstrap: confidence interval and test

Residual bootstrap for parametric regression models

Bootstrap for NP density and regression

4. **Specification Testing of Regression Models (week 8-9):**

Differencing test

Smooth test: Zheng's test

Non-smooth test: Bierens' ICM test

5. **Semiparametric Models (week 10-11):**

Partially linear model

Single-index model

Additive model

6. **Quantile Regression (week 12, if time permits):**

Estimation of quantile function: conditional and unconditional

Inference for quantile restrictions

期末考试时间：2015 年 12 月 8 日

五、教学方式

I will provide slides and notes for the students. Active interaction between students and the instructor during the class is a necessary part of this course.

六、教学过程中 IT 工具等技术手段的应用

Projector and computer installed with basic econometric softwares.

七、教材

There is no required textbook. A list of references and recommended readings will be given during the lectures. A popular book about the usage of nonparametric methods in econometrics is:
Li, Q. and Racine, J. (2006) "Nonparametric Econometrics" (Princeton University Press).
I will also use notes from Prof. Miguel Delgado of UC3M and Prof. Peter Robinson of LSE.

八、参考书目

Silverman, B. W. (1986) "Density Estimation for Statistics and Data Analysis" (Chapman & Hall/CRC)
Fan, J. and Gijbels, I. (1996) "Local Polynomial Modelling and Its Applications" (Chapman & Hall/CRC)
Pagan, A. and Ullah, A. (1999) "Nonparametric Econometrics" (Cambridge University Press)
Horowitz, J.L. (2009) "Semiparametric and Nonparametric Methods in Econometrics" (Springer)

九、教学辅助材料，如 CD、录影等

Not necessary until now. Simulation using numerical methods will be demonstrated during the classes.

十、课程学习要求及课堂纪律规范

Students who are interested in this course should be motivated and focused during the course. The course also encourages interaction between the instructor and the students.

十一、 学生成绩评定办法（需详细说明评估学生学习效果的方法）

There will be regular assignments (50%) and a paper report (50%):
90% - 100% Grade A+
80% - 90% Grade A
70% - 79% Grade B
60% - 69% Grade C
0% - 59% Fail