Advanced Econometrics 2,
Semi- and Non-parametric Methods
January 2017
Assignment Week 3

Hand in on Blackboard before17:00 Friday, 26 January 2018 in the assigned teams of 2 students.

The purpose of this assignment is for you to learn how to adapt a basic program to your own needs and to show that nonparametric techniques lead to interesting results that standard methods would miss.

You have to identify a research question, find a solution and write a short report (3 pages + appendix). You give (at least) one extension to one of the programmes and/or functions that are given on Blackboard.

On Blackboard you can find the:
1. basic programs **Bimodal.m**, **UKworkhours.m**, **PSIDincdistr.m** and **MedicalVietnam.m**
2. associated data as well as a panel dataset on Italian GDP
3. basic functions **npdensity_kjvg.m** and **npregress_kjvg.m**

Extend one or a combination of these programs in one or two ways to e.g.

- allow for different **bandwidth selection** methods
- implement **cross validation**
- deal with **multivariate data** on very different scales
- deal with the end-point bias
- deal with **regression**
- capture **bimodality** without oversmoothing when the modes are very distinct
- Analyse an interesting example e.g.
  - bimodality of the IV estimator with weak instruments or investigate the density of the LM,LR, and Wald test in one of the cases considered in week 2 (where the test statistic is not close to a chi-squared distributed random variable or where the size or power curve behaves very strangely)
  - the nonlinear regression model of Advanced Econometrics 1
- provide **confidence intervals** for the density estimate or regression function
- Apply it to **interesting data set** that you are interested in and found yourselves to capture features that ML based on standard distributions would miss.

Submit in Blackboard before 17:00 Friday , 26 January 2018 in the teams of 2 assigned in week 1:

1. A **report** with research question, appropriate formula's and your results (max 3 pages)
2. np_*yournames*.m, where *yournames* stands for your surnames
3. np_fion_*yournames*.m + data files if different from the ones we have provided and such that your programme np_yournames.m will run.

Plagarism will not be tolerated.