ORIE 7790 — Statistical Modeling with Splines

Fall 2009, D. Ruppert

This will be a seminar course where students will lead discussion of the papers which should be read beforehand. Grades will be based solely on class participation.

Students should be familiar with mathematical statistics at the level of ORIE 6700 and linear and generalized linear models. Familiarity with Bayesian statistics and MCMC would be helpful.

There will be one 75 minute class per week, so the course will be 1.5 credits. The class time will be chosen to minimize conflicts with other courses. If you wish to enroll in the course, email to me (dr24) the times when you are available.

We will start with the paper:

Eilers, P. H. C. and Marx, B. D (1996). Flexible smoothing with B-splines and penalties (with Discussion). *Statist. Sci.* **11**, 89–121.

The instructor will select papers for discussion but suggestions are welcome. For background reading, I suggest either of:

Ruppert, D., Wand, M. P., and Carroll, R. J. (2003) *Semiparametric Regression*, Cambridge, UK: Cambridge University Press.

Wood, S.N. (2006a). *Generalized Additive Models: An Introduction with R.* Boca Raton, Florida: Chapman & Hall/CRC.

Both of these books have an applied flavor. The papers we discuss in the course will also cover theoretical developments. There has been an explosion of research in this area. A survey paper of recent developments can be found at:

http://www.uow.edu.au/ mwand/sprpap.pdf