

Design of experiments for nonlinear models

Jesús López-Fidalgo¹

SUMMARY

This course will try to show why experimental design is an exciting area in statistics. You may have had the chance to work in problems related to many different fields, from different statistical methodologies to any experimental science. Wherever there is a variable under the control of the experimenter there is an opportunity to look for an experimental design in order to optimize the results. The course will be focused on optimal experimental design more than in the classical experimental design approach. The theory applies in an elegant and rigorous way to linear models, but nonlinear models frequently show up in practice. After stressing the importance of designing an experiment a brief introduction to the theory for linear models will be made. Then there will be time to adjust this theory to nonlinear models. Some interesting books to be initiated in this area are [2], [4], [5], [3] or the most recent [1].

Keywords: Exact and approximate design, Fisher information matrix, optimality criteria, general equivalence theorem

AMS Classification: 62K05

References

- [1] ATKINSON A. C., DONEY A. N. AND TOBIAS R. (2007). *Optimum Experimental Designs, With SAS*. Oxford science publications, Oxford.
- [2] FEDOROV V. (1972). *Theory of optimal experiments*. Academic press, New York.
- [3] FEDOROV V. AND HACKL P. (1997). *Model-oriented design of experiments*. Springer, New York.
- [4] PAZMAN A. (1986). *Foundations of Optimum Experimental Design*. D. Reidel Pub., New York.
- [5] PUKELSHEIM F. (1993). *Optimal Design of Experiments*. John Wiley & Sons, New York.

¹University of Castilla-La Mancha
Jesus.LopezFidalgo@uclm.es