Information matrices of maximal parameter subsystems in linear models

Thomas Klein
Institut für Mathematik, Universität Augsburg,
D-86135 Augsburg, Germany

Abstract

Information matrices play a central role in the theory of design of experiments. In Pukelsheim's (1993) terminology, one distinguishes a moment matrix, which captures the general statistical properties of a design within a given linear model, and an information matrix, which also reflects certain statistical properties of the design, but refers to a specific parameter subsystem of interest. Such information matrices gain special importance when the model is over-parameterized, that is, when the full parameter vector is not estimable. In this case, it is often convenient to consider a maximal parameter subsystem of the model. We show that information matrices for such maximal parameter subsystems are linear functions of the moment matrices. With this result, design problems for maximal parameter subsystems are shown to be equivalent to design problems for the full parameter vector of a minimally parameterized model.

References:

1. Klein, T. (2003). Information matrices of maximal parameter subsystems in linear models. *Statistics & Probability Letters* **62** (4), 355--360.
2. Pukelsheim, F. (1993). *Optimal Design of Experiments*. Wiley, New York.