

Design Issues for Generalized Linear Models: A Review

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Abstract: Generalized linear models (GLMs) have been used quite effectively in the modeling of a mean response under nonstandard conditions, where discrete as well as continuous data distributions can be accommodated. The choice of design for a GLM is a very important task in the development and building of an adequate model. However, one major problem that handicaps the construction of a GLM design is its dependence on the unknown parameters of the fitted model. Several approaches have been proposed to solve this problem in the past 25 years. These approaches, however, provided only partial solutions that applied in only some special cases, and the problem, in general, remains largely unresolved. The purpose of this article is to focus attention on the aforementioned dependence problem. We provide a survey of various existing techniques dealing with the dependence problem. This survey includes discussions concerning locally-optimal designs, sequential de-

signs, Bayesian designs, and the quantile dispersion graph approach for comparing designs for GLMs.

Key Words: Bayesian design, Dependence on unknown parameters, Locally-optimal design, Logistic regression, Response surface methodology, Quantal dispersion graphs, Sequential design.