D_A-MAXIMIN MARGINAL DESIGNS FOR GENERALIZED LINEAR MIXED MODELS

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The optimal design theory deals with the assessment of the optimal simultaneous distribution of all independent variables prior to data sampling. In many practical situations, however, covariates are involved for which the distribution is not previously determined. The optimal design problems may then be reformulated in terms of finding the optimal marginal distributions for a specific set of variables. In general, the optimal solution may depend on the unknown (conditional) distribution of the covariates. Dealing with this problem, this presentation discusses the D_A - Maximin procedure to account for the uncertain distribution of the covariates. Sufficient conditions will be given under which the balanced design of a subset of independent discrete variables is D_A - Maximin. The sufficient conditions are formulated for Generalized Linear Mixed Models with an arbitrary number of quantitative and qualitative independent variables, covariates and random effects. An application of the theorem will be given as well, motivating the use of D_A - Maximin marginal designs.