

Bayesian optimal design of experiments with quantitative and qualitative responses

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Systems with quantitative and qualitative (QQ) responses are widely encountered in many applications. Experiments are conducted to study such systems. Classic experimental design methods are not suitable for such experiments because they can only focus on one certain of response but not both QQ responses. We develop Bayesian D -optimal design criteria for quantitative and binary qualitative responses. Both noninformative and informative conjugate prior distributions on the unknown parameters are considered. Iterative design search algorithms are developed to find the local D -optimal designs. The performances of the proposed methods are shown through examples and simulations.