Minimal-point Designs for Second-order Response Surfaces

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In this work, we are interested in constructing minimal-point designs for second-order response surfaces. Here a two-stage method is used. First a proper first-order design with small supports would be selected and then the remaining supports are added according to an optimal criterion. A modified simulated annealing algorithm is applied for finding these designs according to the different criterion. Besides D- and A-optimal criteria, rotatable and slop-rotatable criteria are also used here. Thus based on the three different types of first-order designs, the corresponding minimal-point designs are found. Finally these designs are then compared with other small composite designs and minimal-point designs by relative efficiencies. It is shown that the proposed minimal-point designs perform well in general.

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