

Quaternary-code Designs: A Better Choice of Design for Experimentation

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Abstract: There was a realization that nonregular designs could be utilized in conducting efficient experiments with flexibility, run size economy, and ability to exploit interactions, but the use of such designs was not common due to the lack of structure for systematic construction. Quaternary-code (QC) design, which is a new class of nonregular designs with similar structure to regular designs, attracts numerous attention from the researchers in design of experiments in the recent years. This talk discusses the advantages on using QC designs over regular designs when an experiment in scientific research or industrial application is conducted, including how the optimal QC design is constructed when some restrictions on experimental resources are given, and how the results from these experiments are analyzed in proper manner. Some real-life examples are given in order to compare the efficiency and economy between the experiments conducted under QC designs and regular designs.

Keywords: design of experiments, nonregular designs, Quaternary-code designs, design efficiency