

## Algorithmic Methods for Covering Arrays of Higher Index

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Covering arrays provide effective testing schemes for observing faults that arise from interactions among few components in large component-based systems. Combinatorial and computational methods to construct covering arrays with as few tests as possible have been widely explored. The *strength*  $t$  of a covering array is the size of interactions covered, and its *index*  $\lambda$  is the minimum number of times each  $t$ -way interaction is covered. Available methods focus on covering arrays of index 1. In many practical applications, however, missing or inaccurate test results can demand that interactions be covered more than once. In this talk, algorithmic methods for constructing mixed covering arrays of index  $\lambda > 1$  are examined. We extend and compare two general strategies, an “in-parameter-order” (IPO) or one-column-at-a-time approach, and a conditional expectation one-row-at-a-time approach.

Keywords: covering array, IPO algorithm, conditional expectation algorithm