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Interleaved Sequences

A covering array CA$(N; t, k, v)$ is a $N \times k$ array over an alphabet of v elements such that for any t-set of columns, each possible arrangement of t alphabet elements occurs at least once in a row. Finding the smallest number of rows N in the array is a central problem, with many good bounds and construction methods for some, but not all, sets of parameters. Covering arrays can be made by taking a sequence with a coverage property and circulating it into a matrix. In this talk we examine interleaved sequences, created by combining a base sequence of period s with nice coverage properties and a shift sequence e of length T, consisting of elements from $Z(q) \cup \infty$. We will discuss what properties are inherited from the base sequence, and under which conditions this is possible. Finally we demonstrate the potential for interleaved sequences to create ϵ-almost covering arrays, where all but $\epsilon\binom{k}{t}$ of tuples are covered for a 'small' ϵ.