CONTRIBUTION: GENERALIZED and FLEXIBLE COPRIME ARRAY

We propose a generalized thinned coprime array by introducing the flexible inter-element spacings, where the conventional one can be seen as a special case. We derive closed-form expression for the range of consecutive lags, written as the functions of the antenna numbers and inter-element spacings. We show that, after optimization, the proposed array can achieve more consecutive lags than the other coprime arrays. In particular, the optimized results also provide the minimum number of antenna pairs with small separation. Simulation results demonstrate the superiority of the proposed GTCA using the subspace-based method.

ABSTRACT: INSPIRED BY TCA

Compared with nested arrays, coprime arrays are proposed with sparser subarrays. A prototype coprime array is made up of two ULAs, where one is M-antenna ULA with inter-element spacing Nd and the other one is N-antenna ULA with spacing Md. M, N are set as coprime integers and d represents the unit spacing.

Then, generalized coprime arrays were developed with two operations. Specifically, one is designed by compressing the inter-element spacing of one subarray and the other is by connecting two displaced subarrays, referred to as coprime array with compressed inter-element spacing (CACIS) and coprime array with displaced subarrays (CADIS). It is shown that CACIS has some redundant antennas and CADIS cannot produce a higher number of consecutive lags. Further, a thinned coprime array (TCA) was proposed by removing the redundancy of the coprime array, which possesses the same number of consecutive lags with fewer physical antennas.

In this paper, inspired by the TCA, we propose a generalized TCA (GTCA) by introducing two co-prime integers as the inter-element spacings of subarrays.

REFERENCES


