OPTIMIZATION OF NONUNIFORM PLANAR ARRAY GEOMETRY FOR DIRECTION OF ARRIVAL ESTIMATION (TueAmPO4)

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Abstract :

In this work, we derived the probability of gross errors in direction of arrival (DOA) estimation for any arbitrary array under assumptions of two dimensional array geometry, isotropic array elements, deterministic incoming signal and AWGN. We proposed a metric function that can be used to optimize the array geometry, based on this derivation and available Cramér−Rao Bound (CRB) analysis in the literature. We used genetic algorithm as an optimization tool in our attempt to seek answer to the generic problem: For a given two dimensional, bounded surface and maximum allowable probability of gross error at certain signal−to−noise ratio (SNR) value, what is the optimum geometry that maximizes the azimuth DOA estimation performance?

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