Guidelines for Student Reports

SYNTHESIS OF CLUSTERED ARRAYS BASED ON TOTAL VARIATION COMPRESSIVE SENSING

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Abstract

Clustered arrays (i.e., arrays using only few different amplifiers) with contiguous sub-arrays (i.e., each sub-array does not interleave with the others) are of great importance in those scenarios where the modularity of the layout has a major importance to reduce the fabrication and maintenance costs (e.g., in radar, satellite, and biomedical applications). Accordingly, several strategies have been proposed in the past to synthesize clustered arrays exploiting the minimum number of different amplifiers. In this framework, the use of Total Variation Compressive Sensing strategies seem to represent a suitable candidate to efficiently solving clustered array synthesis problems. Indeed, the synthesis problem can be recasted in a TV sense by assuming that the unknown is represented by the array excitation, which have to match a desired radiated pattern (through the well-known Green radiation operator) with the "sparsest derivative" (i.e., with the minimum number of different amplifiers). The objective of this project is to implement the overall synthesis strategy starting from the available solvers and synthesis blocks, and to test it for a set of standard test cases in linear arrangements.

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