

# Progettazione di Sub-Array Contigui mediante Bayesian Compressive Sampling

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## Abstract

La realizzazione di sistemi radianti per applicazioni radar, satellitari e di remote sensing richiedono l'utilizzo di array di grandi dimensioni con un numero molto contenuto di elementi radianti ed in grado di garantire valori molto ridotti di lobo secondario.

Tali obiettivi sono solitamente ottenuti mediante tecniche di sub-arraying che permettono di dividere la difficoltà del problema di sintesi nei seguenti sotto-problemi

(a) design dei sub-array (selezione elementi all'interno del lattice di interesse)

(b) selezione alimentazione ottima per i sub-array da accorpare

Una metodologia comunemente adottata per risolvere tali problemi si basa sull'utilizzo di tecniche di ottimizzazione globale, quali gli algoritmi genetici (GA). Tali tecniche risultano efficienti e forniscono eccellenti prestazioni, ma non sono applicabili con facilità ad array di grandi dimensioni, a causa dei tempi di convergenza che possono aumentare notevolmente.

In questo scenario, l'attività si propone di seguire un approccio alternativo basato sull'utilizzo di metodologie di Compressive Sampling per la selezione delle aggregazioni ottime e dei relativi pesi a partire da

- un codebook di possibili aggregazioni contigue

- un pattern di riferimento da approssimare

Scopo della presente attività è perciò quello di studiare ed utilizzare la tecnica di sub-arraying basata su Compressive Sampling congiuntamente a codebook di aggregazioni contigue. L'attività si occuperà di valutare le prestazioni di tale tecnica in funzione della dimensione del codebook (numero di array base considerati), della dimensione delle singole codewords, della dimensione dell'array complessivo e del pattern richiesto.

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