

CONTROLLO DEI PHASED-ARRAY PER MEZZO DI UNA STRATEGIA BASATA SULLA RICERCA DELLA DIREZIONE D'ARRIVO DELL'INTERFERENTE E LA SINTESI DEL BEAM-PATTERN OTTIMO

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Abstract

Nell'ambito del controllo degli array adattivi, le strategie di beamforming si occupano della soppressione dei segnali interferenti attraverso il posizionamento dei nulli del diagramma di radiazione modificano i pesi. Partendo dal modello formulato da Applebaum, che considera il rapporto segnale su interferente più rumore (SINR), è possibile riformulare il problema della scelta della combinazione di pesi ottimi in una procedura di ottimizzazione, risolvibile per mezzo di una qualsiasi metodologia.

L'obiettivo del progetto è quello di applicare una strategia di massimizzazione del SINR basata sulla scansione delle possibili direzioni d'arrivo degli interferenti e la sintesi di beam pattern ottimi caratterizzati da una finestra di attenuazione. In dettaglio, a partire da una serie di diagrammi di radiazione noti a priori e caratterizzati da un certo numero di finestre di attenuazione poste a differenti posizioni, l'algoritmo ricerca in modo intelligente la presenza di uno o più interferenti mediante la scansione delle direzioni d'arrivo. Successivamente, grazie alla definizione di una serie di regole di ricerca, la scelta della combinazione di pesi ottimi avviene grazie al monitoraggio del SINR.

Nel caso multi-interferente, il problema si risolve in linea di massima nel modo seguente: (1) trovare la posizione di un interferente mediante lo spostamento di una finestra di attenuazione e la valutazione del SINR; (2) fissare la prima finestra e passare alla ricerca del secondo interferente. Le operazioni si ripetono fino a quando il SINR rimane costante. Tale problema pu essere visto anche come un albero, i cui livelli corrispondono al posizionamento delle varie finestre di attenuazione.

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