Guidelines for Student Reports

Sintesi Di Array Riconfigurabili Per Applicazioni Radar Tracking

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Abstract

I radar per applicazioni di tipo tracking generalmente utilizzano antenne (recentemente per lo più array di antenne) in grado di generare due diversi pattern, un pattern somma ed un pattern differenza. L'informazione ricevuta sui due canali permette di ricavare la posizione angolare di un oggetto (azimuth e/o elevation) e la sua distanza (range). Poiché in molte applicazioni è necessario avere una stima precisa della posizione dell'oggetto, i due pattern sono generati utilizzando reti di alimentazioni separate ad indipendenti al fine di ottenere elevate prestazioni. In questo caso, le eccitazioni degli elementi dell'array sono calcolate per mezzo di ben note tecniche analitiche (es., Dolph-Chebyshev e Taylor per i pattern somma, Zolotarev e Bayliss per i pattern differenza).
Tale soluzione non è di norma utilizzata in quanto troppo costosa e difficile da realizzare. Si preferisce considerare delle soluzioni compromesso che permettono di soddisfare i requisiti sui due pattern ed altresì di ridurre la complessità circuitale (ed i costi) dell'antenna. In questo ambito, il presente progetto ha l'obiettivo di definire una strategia innovativa che permette di sintetizzare un'antenna ad array riconfigurabile in grado di generare sia pattern somma sia pattern differenza, dove la rete di alimentazione dedicata ai due pattern è in parte o del tutto condivisa. La tecnica si basa sulla soluzione di problemi di tipo Convex Programming (CP) è garantisce di ottenere delle soluzioni compromesso “ottimali”.

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