BCS-Based Inverse Scattering Method within the Born Approximation

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Abstract

Le tecniche di "Compressive Sampling" (CS), recentemente sviluppate nell'ambito dell'elaborazione digitale dei signali, si occupano di permettere la ricostruzione affidabile di segnali ad alta risoluzione con un numero di misure del fenomeno di interesse molto inferiore rispetto ai requisiti dati dal teorema del campionamento di Nyquist. Tali tecniche hanno come requisiti fondamentali (a) la linearità del problema, (b) la possibilità di rappresentare le incognite mediante vettori "sparsi" (cioè con pochi coefficienti non-nulli). Le tecniche di CS sono già state applicate con successo a numerosi problemi pratici in ambito radar, compressione delle immagini e della voce, e compressione video, nonché a problemi di microwave imaging.

Obiettivo del progetto è valutare le prestazioni di tali tecniche in problemi di imaging a microonde formulabili nell'approssimazione di BORN (BORN-I). In particolare, l'attività si occuperà di valutare un codice per l'inversione a microonde basata sul Multi-Task Bayesian Compressive Sampling (MT-BCS) correlando le informazioni provenienti dalle differenti viste per ottenere ricostruzioni ad elevata affidabilità.

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