Alternating Projection Algorithm for Toeplitz Matrix Approximation

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Abstract

Alternating projection onto convex sets is powerful tool for signal and image restoration. The extensions of von Neumann's [3] alternating projection method by Dykstra and Han [1, 2] permit the computation of proximity projection onto certain convex sets. This paper exploits this fact in constructing a globally convergent method for computing the closest positive definite symmetric Toeplitz matrix to a specified matrix. Some applications to signal processing and control problems are discussed. Comparative numerical results are also reported.

Key words : Alternating projections, least distance functions, non-smooth optimization, positive semi-definite matrix, Toeplitz matrix.
AMS (MOS) subject classifications 65F99, 99C25, 65F30

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