Matlab code for BLO-OMP

Wenjing Liao and Albert Fannjiang

March 17, 2014

1 Spectral estimation

The package contains the codes of Orthogonal Matching Pursuit (OMP) and Band-excluded and Locally Optimized OMP (BLO-OMP) for the spectral estimation problem:

\[ y_k = \sum_{j=1}^{s} x_j e^{-2\pi i k \omega_j} + e_k, \]

where \( \omega_j \in [0, 1) \), \( x_j \in \mathbb{C} \), \( k = -f_c, \ldots, f_c \) and \( e \sim N(0, \sigma^2 I) + iN(0, \sigma^2 I) \).

2 Functions

1. **Main**: the main function where frequencies and measurements are generated.

2. **OMP**: the code of realizing OMP [2].

3. **BLOOMP**: the code of realizing BLO-OMP [1].

4. **H_dist**: the code of computing the Hausdorff distance between two frequency support set. For example, let \( S = \{\omega_j\} \) and \( \hat{S} = \{\hat{\omega}_j\} \). The Hausdorff distance between \( S \) and \( \hat{S} \) is

\[
d(\hat{S}, S) = \max \left\{ \max_{\omega \in \hat{S}} \min_{\omega' \in S} d(\hat{\omega}, \omega'), \max_{\omega \in S} \min_{\hat{\omega} \in \hat{S}} d(\omega, \hat{\omega}) \right\}.
\]

where \( d(\omega, \hat{\omega}) \) is the distance between \( \omega \) and \( \hat{\omega} \) on Torus.

References
