

Department of Electrical and Computer Engineering
The Johns Hopkins University
520.648 Compressive Sensing and Sparse Recovery – Spring 2018

Homework Assignment I

Reading Assignment: Lecture Notes

Computer Assignment: Sparse Recovery via ℓ_0 -minimization

1. **Recovery Challenge:** We have a signal \mathbf{x} of 100 samples ($N = 100$) where only 3 of these samples are nonzero ($S = 3$). The location and magnitude of these nonzero samples are unknown. We have applied two different sensing matrices on \mathbf{x} and obtained two set of measurements. The two sensing matrices as well as the two corresponding measurement vectors can be downloaded from the course web page. Can you recover \mathbf{x} by solving the classic ℓ_0 -minimization problem? *Hint:* Matlab built-in function *nchoosek*(1 : N , S) yields all subsets of S columns.
2. Do you have any observation on the sensing matrices and the two recovered signals \mathbf{x} ?

Due date: **Thurs, Feb. 8th** in class