Learning Sparse Representations for Image and Signal Modeling

PhD Course, DEIB 2021

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Assignments

- Play with the scripts provided testing different configurations for the α parameters and the stopping criteria.

- Modify the script to perform FISTA following Section 5.4.3 from Brendt's notes. Compare the performance on the two algorithms

- Implement functions for ISTA and FISTA

- Test the above functions on image patches instead of the linear problem in the script provided. Use the dictionary learned from natural patches provided in the previous class. Compare ISTA and FISTA performance and number of iterations.

- Why is $|| \cdot ||_0$ not a norm?

- Prove that soft-thresholding is the proximal mapping of

$$\lambda \left|\left| \cdot \right|\right|_1$$