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Numerical Optimisation, COMPGV19

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Solutions tutorial Nonsmooth Optimisation

The solution to Exercise 1 are in tutorial9_exercise1.m.

We implemented following methods: ISTA,

FISTA: A. Beck, M. Teboulle, *SIAM J. Imaging Sci.*, 2(1), 183–202, 2009 http://dx.doi.org/10.1137/080716542

ADMM: S. Boyd, N. Parikh, E. Chu, B. Peleato, and J. Eckstein

Foundations and Trends in Machine Learning, 3(1):1–122, 2011.

and a gradient descent for reference.

For comparison, we applied primal-dual and log-barrier methods implemented in the package l1-magic

https://statweb.stanford.edu/~candes/l1magic/

This package contains a document which details how to arrive at the formulation of the problem for those methods.

We uploaded an additional file tutorial9_exercise2.m which is an adaptation of the problem and solution

in Exercise 1 to image i.e. the signal is an image with +/- 1 spikes, which we recover from

1) random measurements,

2) subsampled 2D Welsh Hadamard measurements

The purpose of this script is to demonstrate how to deal with images within optimisation problem.


ADMM.m


fista.m


gradientDescent.m


ista.m


softThresh.m


subsampleAdjoint.m


tutorial9_exercise1.m


tutorial9_exercise2.

m

tutorial9.pdf

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The MyFeedback dashboard allows students and their personal tutors to view feedback and grades across modules in one place.
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