

Numerical Optimisation, COMPGV19






Numerical Optimisation, COMPGV19

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Solutions tutorial Nonsmooth Opt **Add WeChat edu_assist_pro**

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.



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