

Matlab Package “Tensor Envelope”

LAST UPDATED: MARCH 1ST, 2016

1 Introduction

“TensorEnvelope” is a collection of MATLAB functions for fitting the tensor response linear model and tensor envelope model in the following paper.

- Li, L. and Zhang, X. (2016+), “Parsimonious Tensor Response Regression”, <http://arxiv.org/abs/1501.07815>.

2 Prerequisites and dependence

- LDR package (<https://sites.google.com/site/lilianaforzani/ldr-package>)
- tensorreg toolbox (<http://hua-zhou.github.io/software/tensorreg/>)
- tensor toolbox (<http://www.sandia.gov/~tgkolda/TensorToolbox/index-2.5.html>)

3 Download and installation

1. Install MATLAB if it has not been installed on the computer.
2. Download “TensorEnvelope.zip”
3. Unzip the zipped file and put the folder into the directory you’d like
4. Download and unzip the three packages (*LDR*, *tensorreg*, *tensor*), then set them as subfolders within the “TensorEnvelope” folder
5. To see an example, go to either “TensorEnvelope_ html.m” inside the “3_ Tutorial” subfolder

4 Copyright and Warranty

This program is free software; you can re-distribute and/or modify it under the terms of the GNU GPL-v2 (GNU General Public License version 2; <http://www.gnu.org/licenses/old-licenses/gpl-2.0.en.html>). This program is distributed for research purposes, but without any warranty, see the GNU General Public License for more details. There is no warranty (explicit or implicit) attached to the "EnvelopeAlgorithms" software. If you find that it does not work correctly, please compile a description of the error and e-mail to: henry@stat.fsu.edu.

5 Extension and Compatibility

The current implementation of the Tensor Envelope package uses the 1D algorithm for fitting an envelope: Cook, R. D., and Zhang, X. (2016), “Algorithms for envelope estimation”, *Journal of Computational and Graphical Statistics*, In Press. The subfolder “1_EnvelopeAlgorithm” contains the implementation of the 1D algorithm and is a subset of the full EnvelopeAlgorithms package (<https://stat.fsu.edu/~henry/Software/>), which includes other optimization options for fitting an envelope. If you want to switch to other envelope fitting algorithms, e.g. full Grassmannian optimization or the ECD and ECS algorithms, you can download the *EnvelopeAlgorithms* package and make some simple modifications in the Tensor Envelope package.