DictLearn V1.0a

A MATLAB® Function for Sparse Dictionary Learning

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Installation Notes

Download `dictlearn_v1.0a.zip` and extract all files into a folder. The required password for unzipping is freely available via email from gtauboec@nt.tuwien.ac.at. Personal/institutional details are requested to be included into this email.

DictLearn V1.0a requires the following software package to be installed:

- `cvx:`   http://cvxr.com/

Notes

DictLearn V1.0a contains the MATLAB® function `basis_opt.m` that computes an orthonormal basis, such that the expansion coefficients of given training signals with respect to this basis are maximally sparse. The implemented algorithm is essential the same algorithm as used for deterministic basis optimization in the MATLAB® Toolbox CS-CHEST V1.0. However, `basis_opt.m` is independent of the specific application and can be used for other purposes as well. Furthermore, the code is better documented. DictLearn V1.0a also includes a demo file, which computes an optimized basis for the channel estimation application.

The routines are not optimized in any way and an improvement in terms of e.g. running time is certainly possible. Furthermore, the code documentation is improvable and support will not be provided in general. However, questions via email will be probably answered; however, this cannot be guaranteed.

For algorithmic details, see [1].

Academic use of the toolbox is permitted, commercial use prohibited, cf. `License_Agreement_DictLearn.pdf`. For commercial use, please contact gtauboec@nt.tuwien.ac.at.

References

[1] G. Tauböck, F. Hlawatsch, D. Eiwen, and H. Rauhut, "Compressive estimation of doubly selective channels in multicarrier systems: Leakage effects and sparsity-enhancing processing," IEEE J. Sel. Top. Signal Process., vol. 4, no. 2, Apr. 2010, pp. 255–271.