VIDOSAT: Video denoising

by online 3D sparsifying transform learning

VIDOSAT is a formulation and an algorithm that adaptively learns a structured overcomplete sparsifying transform with block cosparsity, or equivalently a union of square sparsifying transforms, and simultaneously clusters the data via sparse coding, as described in the following "VIDOSAT" paper:

[1] B. Wen, S. Ravishankar, and Y. Bresler. "Video denoising by online 3D sparsifying transform learning." IEEE International Conference on Image Processing (ICIP), pp. 118 - 122, 2015.

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- **VIDOSAT** is a collection of Matlab functions that implement the VIDOSAT algorithm presented in the above paper.

- **VIDOSAT** includes

    o   A collection of the VIDOSAT Matlab functions.

    o   Example data that enable to replicate the example of the results presented in the VIDOSAT paper.

·   If you have any questions on VIDOSAT, you are welcome to contact the authors.

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DOCUMENTATION

VIDOSAT Description: VIDOSAT is an online video denoising algorithm by adaptively learning a 3D sparsifying transform online.

The following is a very brief description of the MATLAB files, which can be used to simulate the various experimental scenarios in our VIDOSAT Paper [1]. Please read the specific MATLAB files for detailed information about them.

MAIN AND SIMULATION CODE:

1.   VIDOSAT_videodenoising.m - accepts gray-scale video with additive Gaussian noise and simulation parameters as inputs, and generates the learned VIDOSAT, as well as the denoised video estimate by VIDOSAT.

PARAMETER SETTINGS:

All the above matlab files have various parameters that need to be carefully/optimally set at the time of use. Examples of parameter values are given by the Matlab functions "VIDOSAT_videodenoise_param.m" and "getVIDOSAT_multipass_param.m", but these may not necessarily provide the best or even acceptable performance for your data.

DATA:

The folder – demo_data - contains a sample data that is used for our demo scripts. The demo data is also used in our VIDOSAT paper [1].

The full data that can be used to reproduce our results in [1] can be provided upon request.