BM3D

Mathematical Models and Methods for Image Processing

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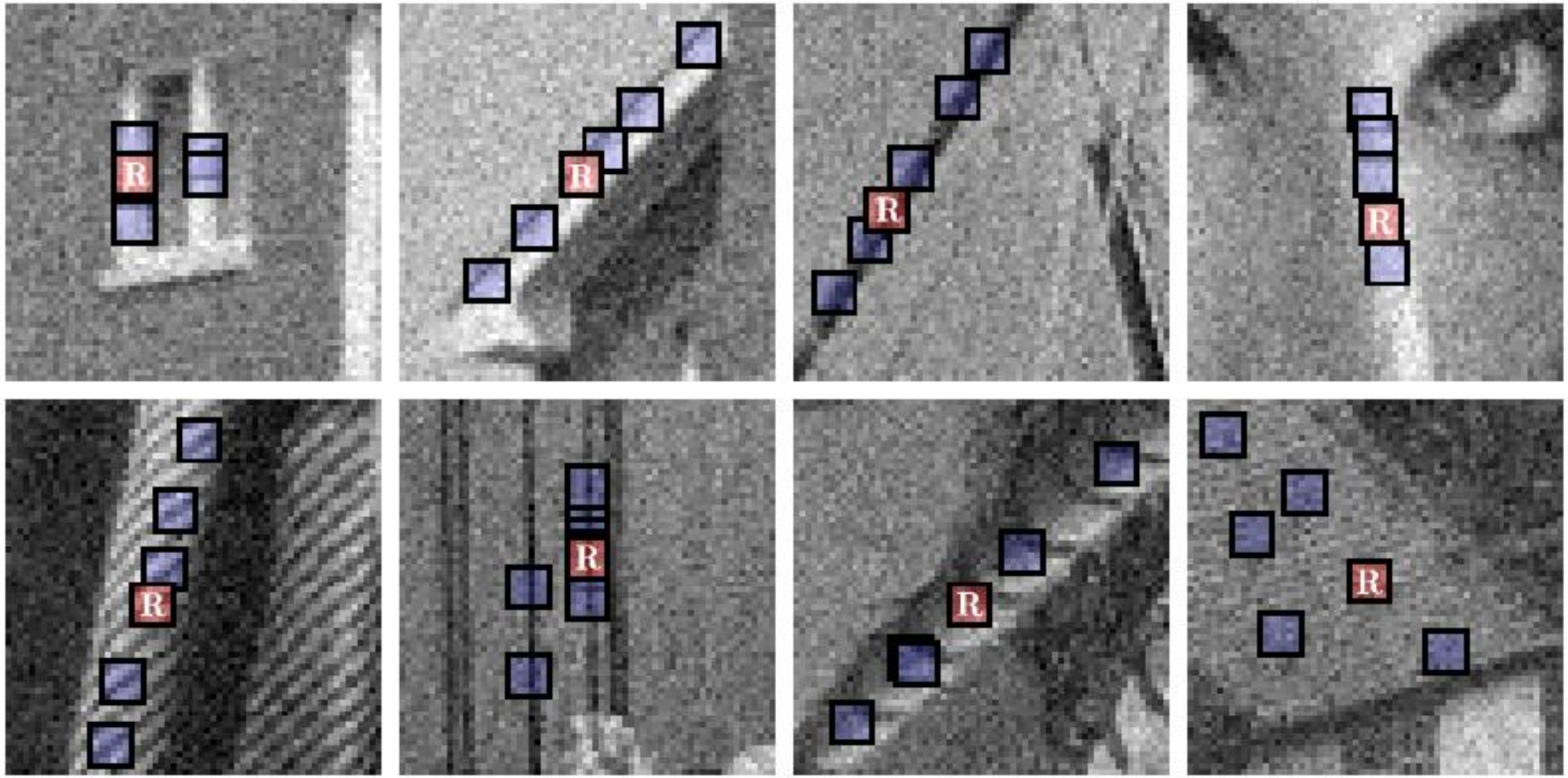
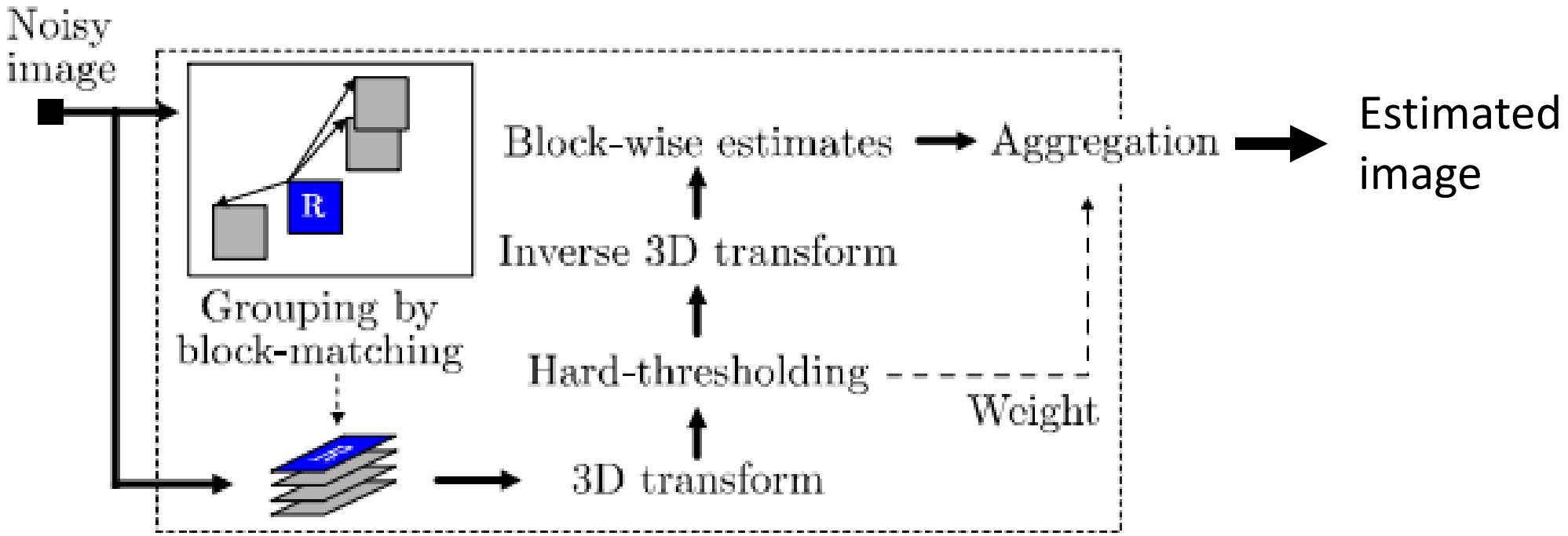
Grouping in BM3D



Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.

The (partial) BM3D pipeline



Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.

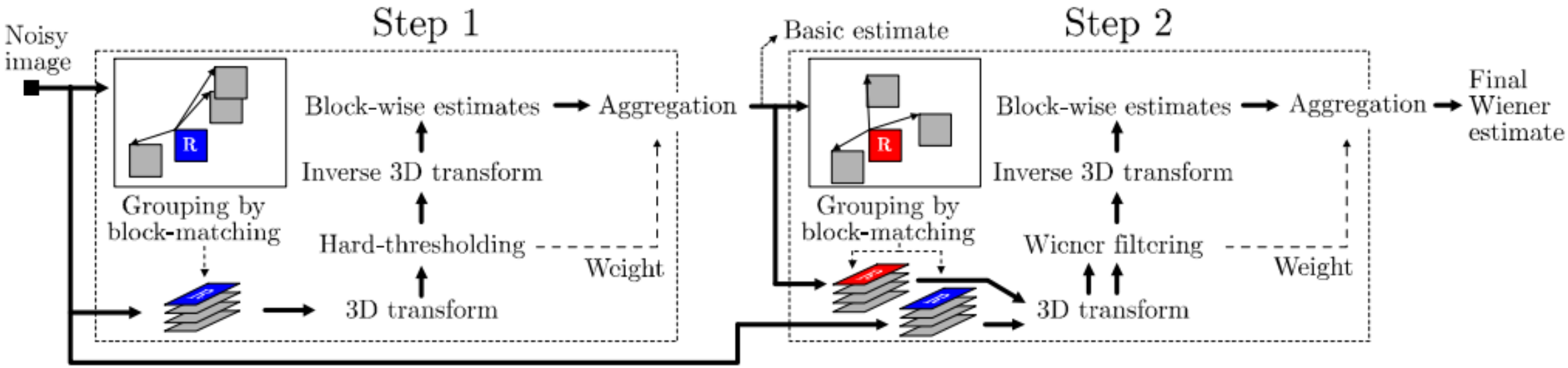
Optional Assignment 1

Implement both steps of the BM3D algorithm

- M=64 (8x8 patches)
- K=16 maximum number of patches in the group
- R=25 size of the squared search neighborhood
- $\epsilon = 0.05, \quad \frac{\left\| s_{r,c} - s_{r',c'} \right\|_2^2}{M} < \epsilon$
- $\tau = 2.7\sigma$
- step=6

Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.

The BM3D pipeline



Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.

Optional Assignment 2

Implement both steps of the BM3D algorithm

- M=64 (8x8 patches)
- K=16 maximum number of patches in the group
- R=25 size of the squared search neighborhood
- $\epsilon = 0.006,$ $\frac{\left\|\left|\hat{\boldsymbol{y}}_{r,c} - \hat{\boldsymbol{y}}_{r',c'}\right|\right\|_2^2}{M} < \epsilon$
- $\tau = 2.7\sigma$
- step=6

Dabov, Kostadin, et al. "Image denoising by sparse 3-D transform-domain collaborative filtering." *IEEE Transactions on image processing* 16.8 (2007): 2080-2095.