IRLS, MOD and ℓ^1 denoising

Mathematical Models and Methods for Image Processing

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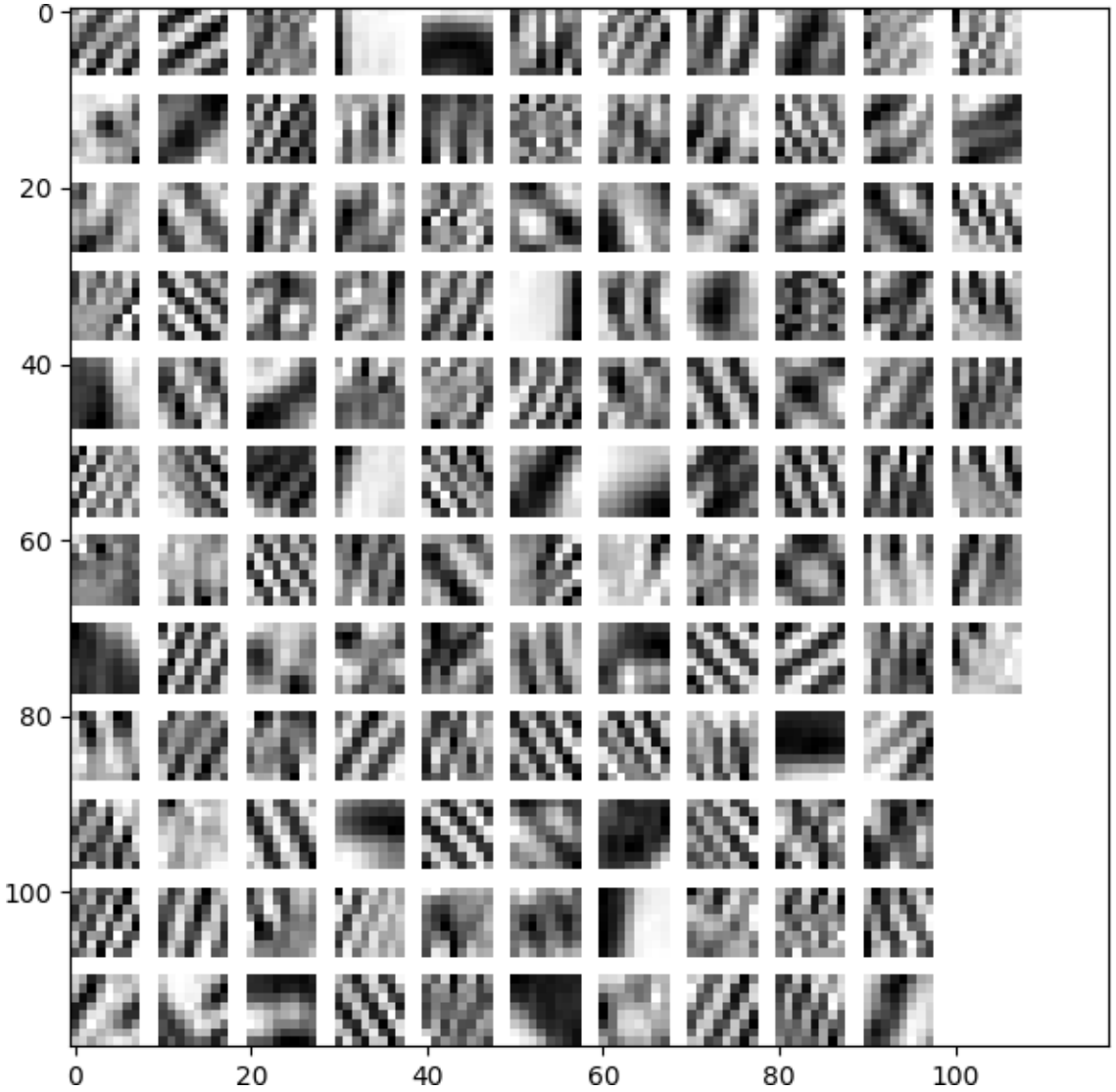
Assignments

- Implement the IRLS algorithm
- Implement the MOD algorithm for dictionary learning using your favorite algorithm for the sparse coding
- Learn a dictionary using MOD from patches extracted from Barbara (see example here)



Assignments

Use your favorite ℓ^1 sparse coding algorithm (ISTA, FISTA, IRLS) to perform denoising of a natural image

- Depending on your implementation it might be time consuming: use an image crop
- Set $\lambda = \tau \cdot \sigma$, with τ to be tuned (a good starting point is $\tau = 2.2$)
- The BPDN is less effective than OMP in denoising, but we will see in next lectures that ℓ^1 based sparse coding outperforms ℓ^0 in other tasks