Appendix 1

Here we describe the definitions relating to the global, local and nonlocal mentioned in the Introduction.

Local and nonlocal priors

When computing a local prior for a target pixel (denoted in orange and bolded point in *Figure S1*), the related adjacent pixels are considered (marked by black crosses in *Figure S1*) of the target pixel.

When the occasion comes into the nonlocal priors for a target pixel, not only do the adjacent pixels need to be calculated but so do the neighborhood pixels in the search window $_n$. The local and nonlocal priors are briefly illustrated in *Figure S1*.

Global prior

In fact, there is no general and specific standards or definitions for the descriptions of global priors. Therefore, we attempt to distinguish global and nonlocal priors according to whether the integrity of the data is considered or not. The global priors indicate that the pixels in a space R^s can be mapped to another space R^k under some transformation, and the dimensions of the 2 space may not be exactly the same. For instance, the wavelet transform is a typical ascending dimension transform, and the subspace decomposition method adopted in this paper is a dimensional reduction transformation.

According to the above concepts, a few representative MECT reconstruction methods containing different priors are summarized in *Table 1*. The local prior is marked when the regularization term relates to the sparsity of intrachannel. When extracting some pixels from a search window, the nonlocal priors are selected in the case of a channelwise operation. For instance, in the pixel extraction process described in Wu *et al.* (31,35), target pixels of all channels are extracted simultaneously. We therefore believe that they also have global priors from considering the integrity of all channels.

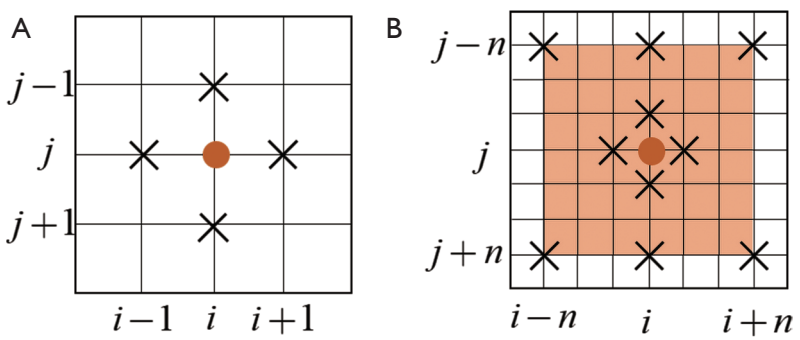

Figure S1 The illustrations of the local and nonlocal priors is shown in (A) and (B), respectively, where orange and bolded points represent the target (*i*,*j*) pixels, and black crosses represent pixels adjacent to (*i*,*j*) or in the search window $_n$.

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