

# Patch-based diffusion models for image reconstruction

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## **Abstract**

Diffusion models can learn strong image priors and use them to solve inverse problems, but they are computationally expensive and require lots of training data. We propose a method that trains diffusion models on patches of images and combines them to obtain an image prior for the entire image. By zero padding the original image and shifting the patch tiling scheme, we avoid boundary artifacts and obtain a score function of the whole image without inputting the whole image into the neural network. This diffusion model can be trained faster, requires less data and less memory, while still having generative capabilities. Our flexible framework allows for the trained network to be used in conjunction with previously established sampling algorithms. We demonstrate the approach by using our method to solve inverse problems including sparse-view CT reconstruction. See arXiv 2406.02462.