IMAGE RECONSTRUCTION IN DEEP IMAGE PRIOR SUBSPACES

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Deep learning-based image reconstruction approaches have demonstrated considerable success in many imaging modalities. However, their reliance on abundant high-quality paired training data remains a significant hurdle in many problem domains where such datasets are not available, for example in medical imaging.

Moreover, deep learning approaches in data scarce scenarios often fail to generalise and are prone to reconstruction artefacts in case of distributional shifts.
In this talk we present an unsupervised/selfsupervised deep learning approach aimed to address these challenges through a two-stage methodology. In the first stage the network is pretrained on simulated training data of ground truth images and measurements. In the second stage the parameters are fine-tuned on the target image, adapting the model to the shift in distribution. Experimental results showcase the effectiveness of our approach, revealing accelerated deployment, improved stability, and competitive performance despite limited training data.