Computational and Data Enabled Science Seminar

Patch Normalizing Regularizer: Reconstruction using only one ground truth image

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Abstract: Reconstructing images from measurements (e.g. sinograms in CT) is a very active research topic. However in many domains, such as medical or material sciences, ground truth data is very hard or costly to obtain. In this talk, we will leverage the idea of patch-based learning for reconstructing images. The regularizer will learn the patch distribution from very few ground truth images by randomly subsampling 6x6 patches and learning their distribution. More specifically, we will use a normalizing flow to learn the patch distribution of the ground truth image, which we call patchNR.

In reconstruction, we will minimize a sum of the negative log likelihood of the patches and the data fidelity term. Our method will be compared to other regularization techniques which use little data for CT, material and texture images. Furthermore, an outlook on how our method can be leveraged to perform zero shot superresolution will be given.

Thursday, October 6, 2022, 10:00 am

Mathematics and Science Center: MSC W301

Mathematics
Emory University