MAP Optimization with NFs

Maximum a posteriori (MAP):

$$\mathbf{x}_{MAP} = \underset{\mathbf{x}}{\text{argmax}} \;\; p(\mathbf{x}\,|\,\mathbf{y})$$

$$\underset{\mathbf{x}}{\text{argmax}} \;\; p(\mathbf{y}\,|\,\mathbf{x})\; p(\mathbf{x}) = \underset{\mathbf{x}}{\text{argmax}} \;\; log\; p(\mathbf{y}\,|\,\mathbf{x}) + log\; p(\mathbf{x})$$

If noise is Gaussian then the data likelihood is given by ℓ_2-norm data misfit

$$\underset{\mathbf{x}}{\text{argmin}} \;\; \frac{1}{2}\|A\mathbf{x} - \mathbf{d}\|_2^2 + \log R(\mathbf{x})$$

Asim, Muhammad, et al. "Invertible generative models for inverse problems: mitigating representation error and dataset bias." International Conference on Machine Learning. PMLR, 2020.

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How do you choose regularization?

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