

A COMPARATIVE ANALYSIS OF RTO AND LANGEVIN SAMPLING METHODS IN BAYESIAN INVERSE PROBLEMS

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Inverse problems in imaging are challenging due to their ill-posedness and their high dimensionality. Variational methods are computationally efficient and interpretable, and they scale well with the dimension. However, they often lack characterizations on the proposed reconstruction. On the other hand, posterior sampling offers a comprehensive set of tools for proposing and analyzing restorations, but their computational demand is often a burden and they struggle to enforce sparsity. In this presentation, we aim at bridging the gap between optimization and sampling and draw a comparison between two classes of sampling methods: Randomize-Then-Optimize (RTO) and Langevin methods. After highlighting their main conceptual differences, we compare them from a practical point of view by tackling two classical inverse problems in imaging: deblurring and inpainting.