Plug-and-Play split Gibbs sampler: embedding deep generative priors in Bayesian inference

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Résumé

Plug-and-Play (PnP) methods are a class of iterative algorithms for inverse problems solving in which regularization is provided by a generic denoiser. Although producing very good results, these PnP optimization methods produce only point estimators and not a complete characterization of the posterior distribution. We propose a new family of stochastic PnP methods by exploiting a Gibbs sampling algorithm coupled with a generative neural network. In addition to a point estimator, the proposed approach provides confidence intervals for a moderate computational cost. The efficiency of the proposed samplers is evaluated through simulations of image reconstruction problems. The performances of the proposed estimators compare favorably with those of the most recent optimization and MCMC algorithms.

Mots-Clés: Inverse Problem, Plug, and, Play, MCMC

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