TBA PRIMAL-DUAL PLUG-AND-PLAY ALGORITHM FOR COMPUTATIONAL OPTICAL IMAGING

(JOINT WORK WITH C. GARCIA, R. R. THOMSON, AND J.-C. PESQUET)C

AUDREY REPETTI

In this work, we propose a data-driven algorithm for computational optical imaging using a lantern (COIL). This can be formulated as a linear inverse problem, that can be solved with proximal algorithms considering a Morozov formulation and a sparsity prior. In this work, we aim to replace the sparsity prior in the proximal algorithm by a learned denoiser, leading to a plug-and-play (PnP) algorithm. The resulting PnP method, based on a proximal primal-dual algorithm, enables to solve the Morozov formulation of the inverse problem. We use recent results in learning theory to train a network with desirable Lipschitz properties, and we show that the resulting primal-dual PnP algorithm converges to a solution to a monotone inclusion problem. Our simulations highlight that the proposed data-driven approach improves the reconstruction quality over variational state-of-the-art method on both simulated and real data.