

## Deep-Plug-and-Play proximal Newton-type method with applications to nonlinear, ill-posed inverse problems

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**Abstract:** We consider variational methods and variational networks for a class of nonlinear-ill-posed least squares inverse problems. These problems can be addressed by proximal regularized Newton-type optimization algorithms. In addition to these model-based approaches we present a hybrid approach which aims to combine the advantages of model-based and data-driven paradigms to provide a parameter-free algorithmic solution to the non-linear inverse problems. As an exemplar application, we consider the Electrical Impedance Tomography, a promising non-invasive imaging technique, mathematically formulated as a highly nonlinear ill-posed inverse problem.