

# Sequential model correction for inverse problems

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## **Abstract**

Inverse problems are in many cases solved with optimization techniques. With linear models and convex objective functionals first-order gradient methods are usually sufficient. With nonlinear models one must resort to second-order methods that are computationally more expensive. In this work we aim to approximate a nonlinear model with a linear one and correct the resulting approximation error. We develop a sequential method that iteratively solves a linear inverse problem and updates the approximation error. We analyze mathematically the convergence properties of the sequence and show numerically that the reconstruction results are superior to the conventional model correction method.