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The inverse modelling toolbox

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Many measurements require solving an inverse problem which is usually large (e.g. in imaging/deconvolution) and often ill-posed. Solving such problems usually requires running an iterative gradient-based optimization. Researchers in those fields need a simple way to specify their inverse modelling problem which is then successively solved. To this aim an inverse modelling (IM) toolbox was constructed in Python based on Google's Tensorflow framework with the aim to be easy to use, versatile, fast and scalable. Compared to directly constructing models in Tensorflow, the IM toolbox supports changing the meaning of variables after their definition, which allows to modify their domain by introducing extra boundary conditions such as their positivity or number of dimensions. The toolbox also supports a range of canned loss functions and regularizers. The toolbox will be presented along with a few of its applications.

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