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Pocket Guide to Solve Inverse Problems with GlobalBioIm

E. Soubies, F. Soulez, M.T. McCann, T.-a. Pham, L. Donati, T. Debarre, D. Sage, M. Unser

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`GlobalBioIm` is an open-source MATLAB$^{®}$ library for solving inverse problems. The library capitalizes on the strong commonalities between forward models to standardize the resolution of a wide range of imaging inverse problems. Endowed with an operator-algebra mechanism, `GlobalBioIm` allows one to easily solve inverse problems by combining elementary modules in a lego-like fashion. This user-friendly toolbox gives access to cutting-edge reconstruction algorithms, while its high modularity makes it easily extensible to new modalities and novel reconstruction methods. We expect `GlobalBioIm` to respond to the needs of imaging scientists looking for reliable and easy-to-use computational tools for solving their inverse problems. In this paper, we present in detail the structure and main features of the library. We also illustrate its flexibility with examples from multichannel deconvolution microscopy.

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