Numerical Solution of Inverse Problem in Functional Near Infrared Spectroscopy using L1-Norm Method

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It has been more than three decades since researchers began investigating functional near-infrared spectroscopy (fNIRs) and its applications with near-infrared light for use in both clinical and pre-clinical settings. In order to increase the accuracy of fNIRs of complex tissue structures, it is necessary to create more advanced image reconstruction methods. Real fNIRs data have been used to develop an implementation of the L1-Norm approach for tackling the inverse problem in this work. The Monte Carlo (MC) simulation is being used to construct the sensitivity matrix for this research. Finally, a numerical algorithm for the L1-Norm approach of image reconstruction is developed and implemented in MATLAB to aid in the process. The results showed good agreement with the actual fNIRs data.