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Computational algorithms in spatial recovery of functional maps in Near Infrared spectroscopic imaging

Hamid Dehghani

University of Birmingham

The development of Near Infrared (NIR) optical tomography and spectroscopic (NIRS) imaging as a functional imaging modality has relied largely on the use of model based image reconstruction. An overview of model based image reconstruction will be presented with specific emphasis on numerical modeling approach of light propagation in tissue as well as generalized image reconstruction using boundary data.

Emphasis will be given to the benefit of different data-types and how these are commonly used to extract functional and meaningful images about pathophysiology. The discussions will be limited to the use of NIR measurements with regards to Human Brain Health with specific details regarding the creation of numerical models as well as detail of the basis for using spectral and structural prior information for parameter recovery.