Numerical approximations of geometric inverse problems of some PDEs

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Abstract

We will focus our talk on the numerical approximations of geometric inverse problem for some PDEs motivated by Elastography. We present several recent results and open questions concerning the numerical reconstruction of the unknown domain where the equations evolve. In the numerical experiments, we solve an appropriate optimization problems.

Two different numerical techniques will be proposed. Firstly, the FEM for the numerical solution of the PDE's, performed with `FreeFem++`. The routines on the `ff-NLopt` package, that provide an interface to a free/open-source library for nonlinear optimization, are also required. On the other hand, we will consider the numerical approximation based on the method of fundamental solutions. It deals with a meshless method. We present some numerical results in the 2D and 3D cases. The first part is joint work with E. Fernández-Cara and the second part is joint work with P. Carvalho, E. Fernández-Cara and J. Rocha.

References

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