Optimization approach based on genetic algorithm for a Parameter identification problem

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Abstract :

This work presents numerical optimization algorithm based on genetic algorithm to solve an inverse problem for Laplace equation to reconstruct the Robin coefficient in boundary value problem. It consists to identify the robin coefficient on the inaccessible part of the boundary representing the corrosion damage of some specimen material. This problem is known to be severely ill-posed in Hadamard sense. Metaheuristics are methods inspired by natural phenomena which have shown their effectiveness in solving several optimization problems in different domains. Thus, adapted genetic operators for real coded genetic algorithm is proposed by formulating the problem into an optimization one. Numerical results are presented to illustrate and evaluate the efficiency and the robustness of the proposed algorithm.