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Identification of Parameters in Systems Biology.

We consider the inverse problem for the identification of the finite dimensional set of parameters for systems of nonlinear ordinary differential equations (ODEs) arising in systems biology. A numerical method which combines Bellman's quasi-linearization with sensitivity analysis and Tikhonov's regularization is implemented. We apply the method to various biological models such as the classical Lotka-Volterra system, bistable switch model in genetic regulatory networks, gene regulation and repressilator models from synthetic biology. The numerical results and application to real data demonstrate the quadratic convergence. (Received September 03, 2018)