
A parallel method of verifying solutions for systems of two nonlinear equations

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The paper describes a new algorithm for verifying solutions of nonlinear systems of equations. Interval methods provide us a few tools for such verification. Some of them are based on topological theorems. Also our new test is based on checking the extendability of the function from a subspace of the boundary of the box to its interior. For a system of two equations, we can provide an efficient implementation. Generalization to a higher number of equations is also theoretically possible, yet cumbersome. Some numerical results are presented.

Keywords: interval computations, nonlinear systems, verification, algebraic topology, extendability, multithreading.