

The thesis is focused on the SIVIA algorithm (Set Inverter via Interval Analysis) designed for solving a continuous constraint satisfaction problem using interval methods and propagation techniques. Basic properties of the algorithm are derived, including the correction of its presented complexity bound. Some improvements concerning the testing of constraint satisfaction and optimization of the number of interval boxes describing the solution are proposed. The thesis also introduces contractors used to enhance the effectivity of the SIVIA algorithm by reducing the interval boxes processed. Presented algorithms were implemented in a solver for nonlinear constraints with a simple visualization of the result using the MATLAB language. A comparison of basic contractors on specific examples is given.