BOUNDING SOLUTIONS OF INTERVAL LINEAR EQUATIONS

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Let a system of interval linear equations be given. The problem of determining the hull of the solution set is NP-hard. Fortunately there are efficient algorithms for computing crude bounds on the hull which require only a polynomial amount of computing. In this paper, we introduce six interrelated methods for sharpening bounds obtained by these efficient algorithms. For each of these methods, the work is polynomially bounded; but considerably more computing is required than for the known algorithms.

Two of these methods can obtain the exact hull for a small fraction of possible problems. Another method can exactly obtain one or more components of the hull for a larger fraction of problems. Each method tends to produce different bounds on the hull. Therefore, the intersection of their results can produce bounds which are sharper than those from any single method.