Publications Mathematicae Debrecen | **Year: 2022** | **Vol.: 100** | **Fasc.: Suppl.**

Title: On solving sparse MRHS equations with bit-flipping

Author(s): Pavol Zajac

We present a new class of probabilistic algorithms that can be used to solve (sparse) MRHS equation systems. The algorithms are based on the idea of bit-flipping: start from a random vector as a potential solution, and try to improve individual bits according to some selected heuristic strategy. We have evaluated a group of algorithms experimentally on a model of sparse MRHS systems based on AND-XOR circuits with low gate count. We compare bit-flipping algorithms with a more complex hill-climbing algorithm and show that bit-flipping algorithms can achieve better success probability for the same number of MRHS evaluations.