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A sublinear Sudoku solution in cP systems and its formal verification. (English)


Summary: Sudoku is known as a NP-complete combinatorial number-placement puzzle. In this study, we propose the first cP-system solution to generalised Sudoku puzzles with $m \times m$ cells grouped in $m$ blocks. By using a fixed constant number of rules, our cP-system can solve all Sudoku puzzles in sublinear steps. We evaluate the cP-system and discuss its formal verification.

MSC:
68Q07 Biologically inspired models of computation (DNA computing, membrane computing, etc.)
05B15 Orthogonal arrays, Latin squares, Room squares
68Q25 Analysis of algorithms and problem complexity
68Q60 Specification and verification (program logics, model checking, etc.)

Keywords:
cP-systems; P-systems; Sudoku problem; NP-complete problem; formal verification

Software:
PAT; P-Lingua

Full Text: Link

References:


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