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The conjugacy problem in groups and its space complexity

Space complexity has long been the focus of interest in computer science. With the prevalence of vast amounts of data, it has become a major consideration in computations. Every problem which can be decided in logarithmic space can be decided in polynomial time, but the converse is not known to hold. We consider the complexity of the conjugacy problem in several classes of groups. In particular, we show that the conjugacy problem in free solvable groups, wreath products of groups and Grigorchuk groups is log-space decidable. (Joint work with A. G. Miasnikov)