Groups, Logic, and Computation. GAGTA-2025

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Solving word equations with Reinforcement Learning and SMT solvers.

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Abstract:

I will provide a short overview to the problem of solving word equations, which is an NP-hard problem with both deep roots in theoretical research and industry applications. I will then explain how to turn Jez's non-deterministic algorithm for solving word equations into a probabilistic heuristic algorithm via Reinforcement Learning techniques and, optionally, SMT solvers. I will describe the promising results of our implementation and subsequent experiments, and, finally, I will discuss pending questions and possible follow up work.