

TITLE: "Proving Correctness of a KRK Chess Endgame Strategy by SAT-Based Constraint Solving

ABSTRACT: Chess endgame strategies in a concise and intuitive way describe the rules the player should follow to ensure win (or draw). We present a SAT-based approach for showing correctness of an endgame strategy. We illustrate the approach on one strategy for the KRK endgame and on a SAT-based constraint solver URSA. The correctness argument is not based on exhaustive search, but on a number of high-level, intuitive lemmas. The lemmas produced SAT instances with hundreds of thousands variables and clauses, but were still handled successfully. The presented methodology can be applied to other similar problems.

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