A Branching Heuristics for Quantified Renamable Horn Formulas

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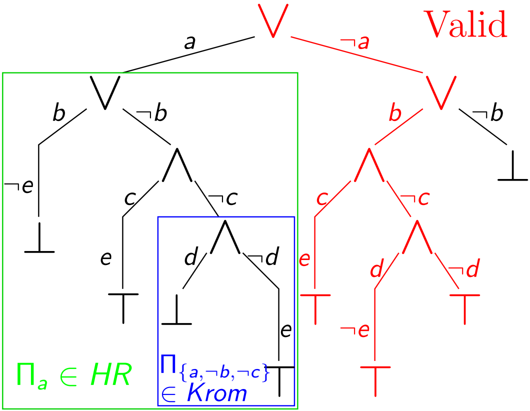
$$\Pi = \exists\, a, b\ \forall\, c, d\ \exists\, e$$

$$\begin{bmatrix} (b \vee c \vee \neg d \vee e) & \wedge \\ (\neg a \vee \neg b \vee \neg e) & \wedge \\ (\neg a \vee d \vee e) & \wedge \\ (\neg c \vee e) & \wedge \\ (a \vee b \vee \neg c) & \wedge \\ (c \vee \neg d \vee \neg e) & \end{bmatrix}$$



- Current QBF solvers have hard time on (renamable) Horn benchmarks
- Idea : branch first on variables whose propagation leads to a renamable Horn formula
- From Hébrard's 1994 recognition of renamable Horn formulas
- Compute a distance δ from a contradiction of Horn renamability for a given **literal** :

  the closer we are to a renamable Horn formula,
  the greater the contradiction distance should be
- Classical balanced heuristics (POSIT) on **variables**
- Restriction to the outermost quantifier scope
- Seems to be effective for some benchmarks