Opening the Black Box: Interpolation in SMT-based Model Checking

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Interpolation-based model checking using SMT

Transition system

Model checker

Safety property

Queries

SAT/UNSAT

Interpolating SMT solver

Interpolators

SMT solver

Proof

Boolean interpolator

Theory interpolator

Safe inductive invariant

Counter-example trace
Tighter cooperation

Smart Model Checker

- Chooses appropriate interpolation algorithm
- Provides domain knowledge

Flexible Interpolating SMT solver

- Offers rich variety of interpolation algorithms
- Can use external guidance