Scalable Verification of Design with Multiple Properties
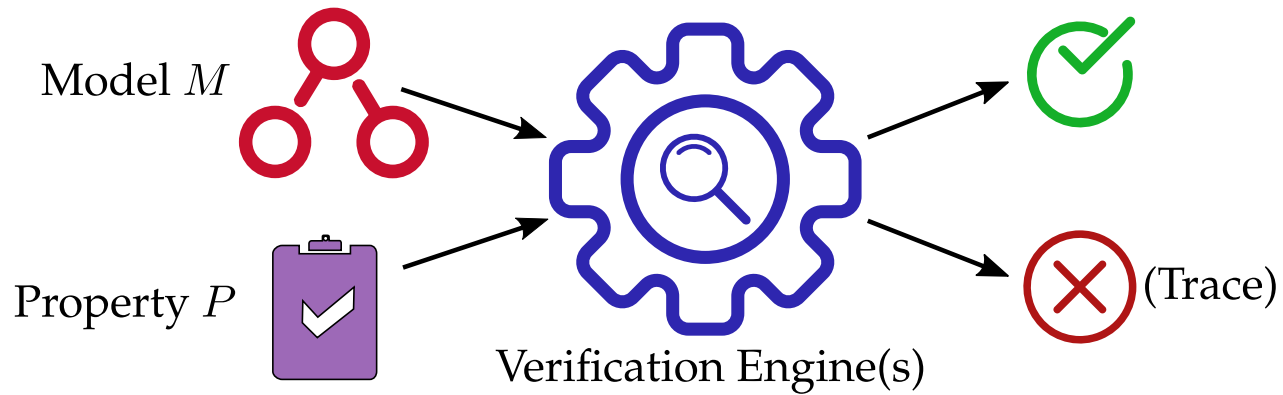
Rohit Dureja

Iowa State University
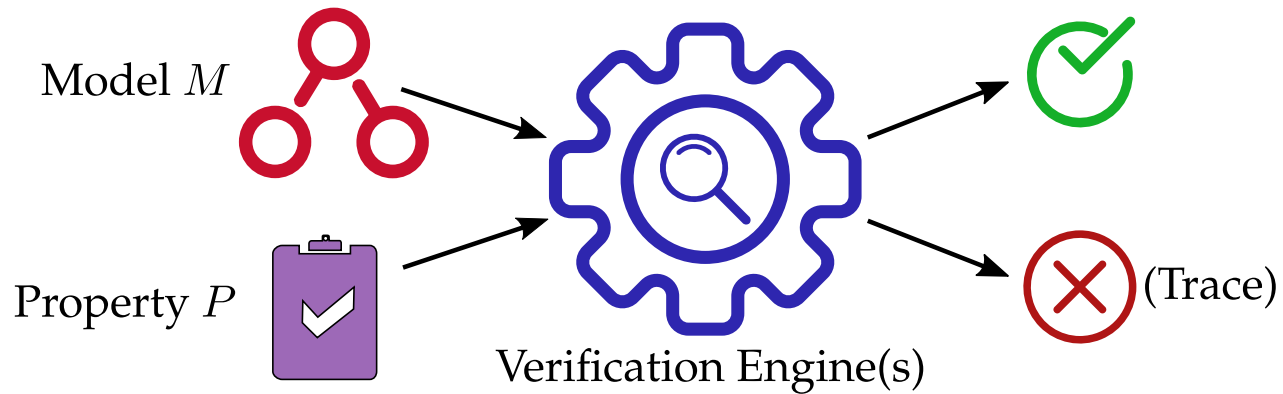
fmcad.19

October 23, 2019

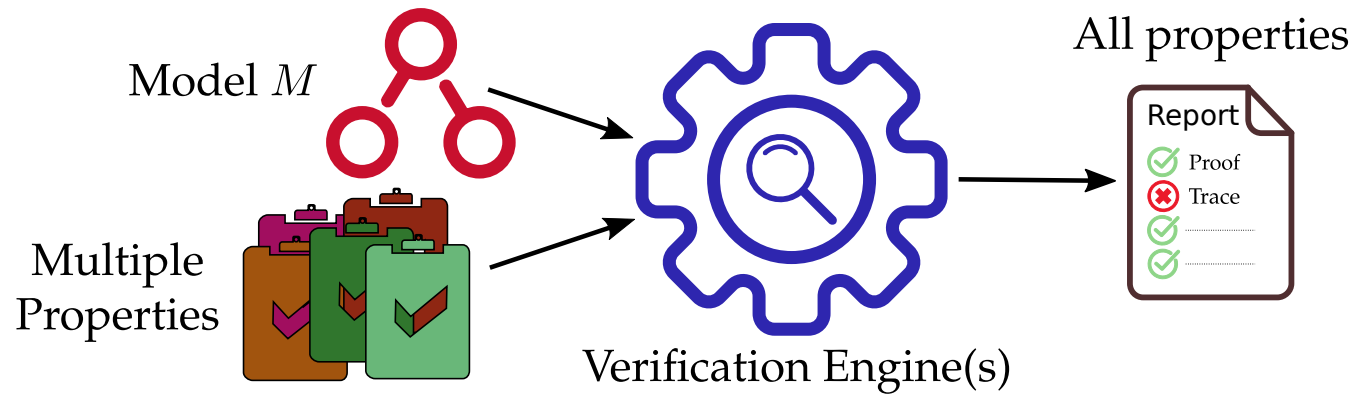# Model Checking

Model M → Verification Engine(s) → ✓ / ✗ (Trace)

Property P

Model Checking

Model M

Property P

Verification Engine(s)

(Trace)

Usually multiple properties to be verified

Model Checking

Model M

Multiple
Properties

Verification Engine(s)

All properties

Report
- Proof
- Trace

Model Checking

Model M

Multiple Properties

Verification Engine(s)

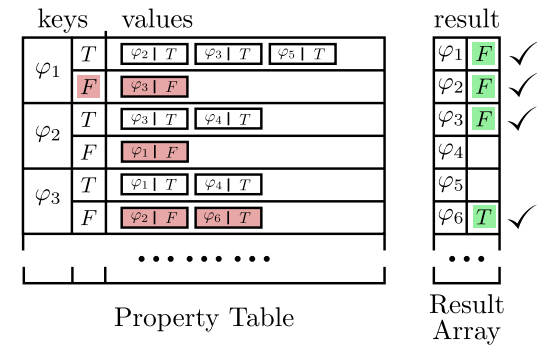All properties

Report
- Proof
- Trace
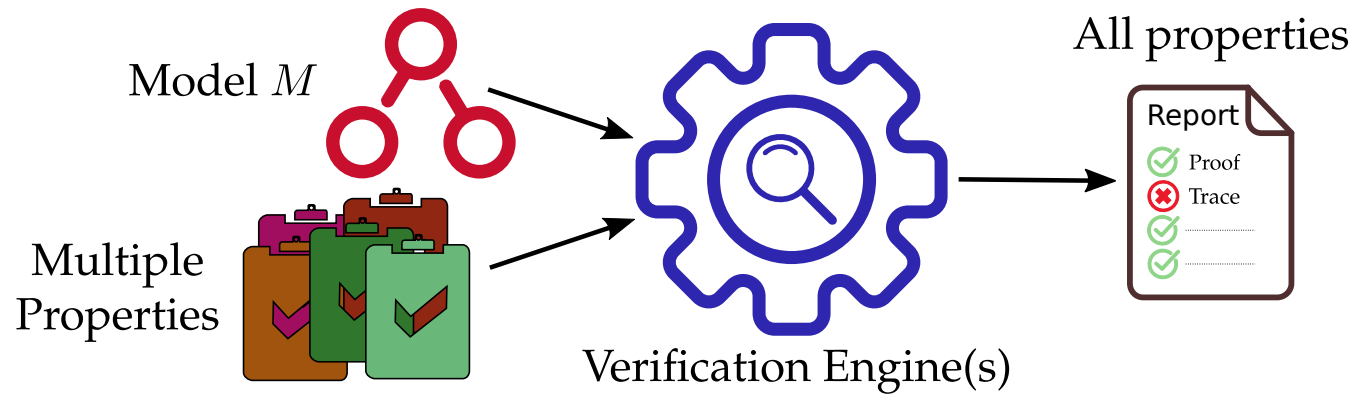
Make multi-property verification scalable

Multi-Property Verification

Multi-Property Verification

Inter-property Relationships

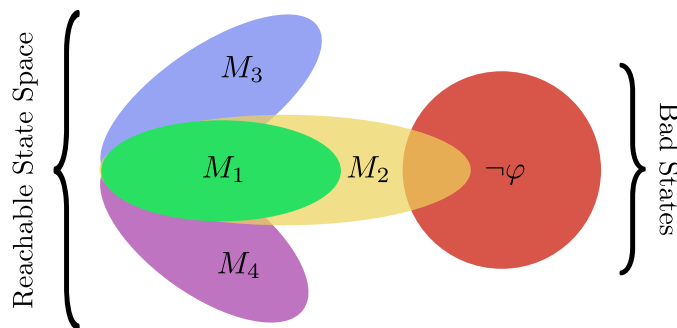Find logical dependencies between properties, check minimal set

Property Table   Result Array

Multi-Property Verification

Inter-property Relationships

Find logical dependencies between properties, check minimal set

Property Table   Result Array

Information Reuse

Model checking information reused across runs, e.g., state space approximations
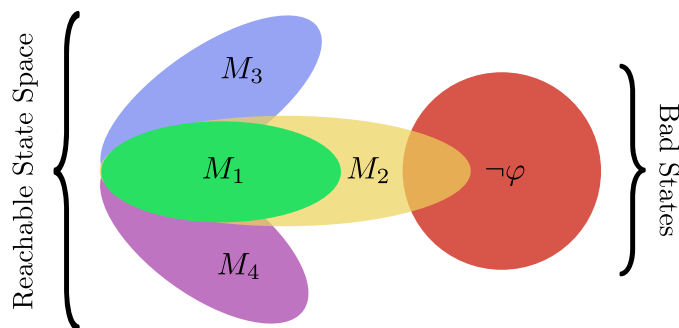
Multi-Property Verification

Inter-property Relationships

Find logical dependencies between properties, check minimal set

Property Table | Result Array

Information Reuse

Model checking information reused across runs, e.g., state space approximations

Improved Orchestration

Partially order and group properties to maximize information reuse