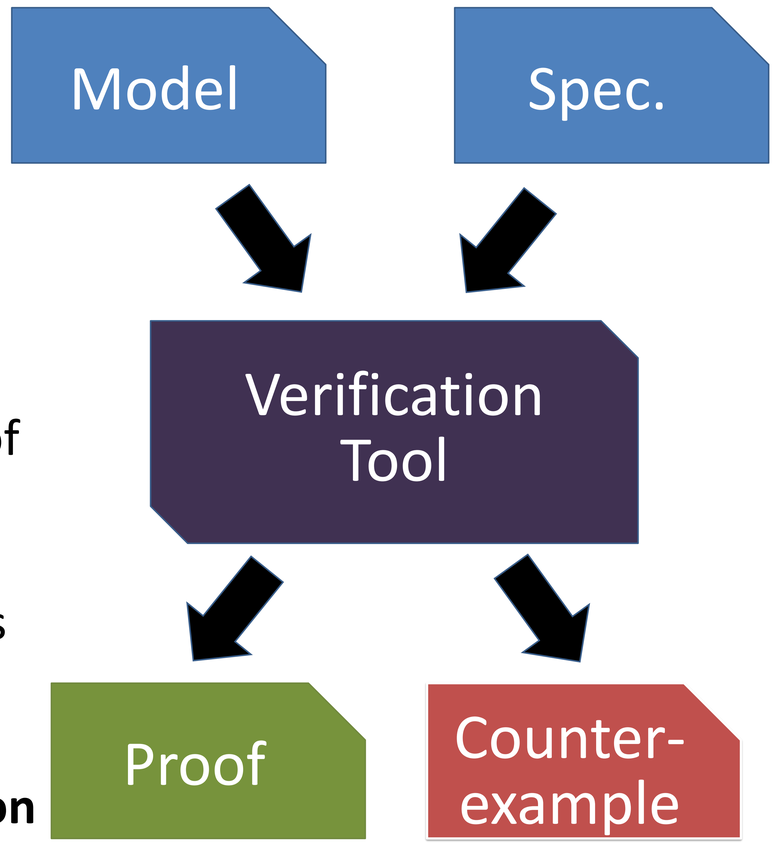
CPS: Small: Numerical and Symbolic Techniques for Verification and Synthesis of Cyber-Physical Systems, No: 1935724, Date: Jan 2019, PI: Parasara Sridhar Duggirala

Challenge:

- Algorithmic verification of safety critical systems suffers from two drawbacks
  1. Model uncertainty.
  2. Counter-example (CE) generation.

Solution:

- Scientific understanding of the effects of uncertainties on safety specification.
- Proposed a new artefact called **robust reachable set** and developed algorithms to compute it.
- Novel approach to **search for CE by formulating it as a constraint satisfaction** problem.



Scientific Impact:

- Safety with model uncertainties is useful in dynamic scenarios.
- Formulation of constraints for extracting CE is useful in software verification and synthesis.

Broader Impact:

- **Society:** Helps design robust safety-critical Cyber-Physical Systems.
- **Industry**: Aids system designers understand the effect of model uncertainties on safety and various corner cases.
- **Education**: Two ugrad. and two grad students.

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