Instrumental Tool for Automata Based Software Development *UniMod 2*

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Overview

- Instrumental Tool *UniMod*
- Data Model
- Models' Validation
- Models' Verification
- Debugging
- Visualization

UniMod base concepts

- *UML*
- Automata based software development
- *Eclipse* platform
- Java programming language
- Open source

Programs' constituents

- Class diagrams
- State chart diagrams
- Java code

UniMod advantages

- Visual building of state chart diagrams
- Ability to interprete and compile programs
- Ability to debug programs
- Ability to validate composed models

UniMod disadvantages

- No ability to verify programs
- Non-optimal (regarding speed) validation algorithm
- Non-extendable visualzation subsystem

New in *UniMod 2*

- Closer integration with *Eclipse* platform
- New validation algorithm
- Ability to verify programs
- New debugging engine

Data Model

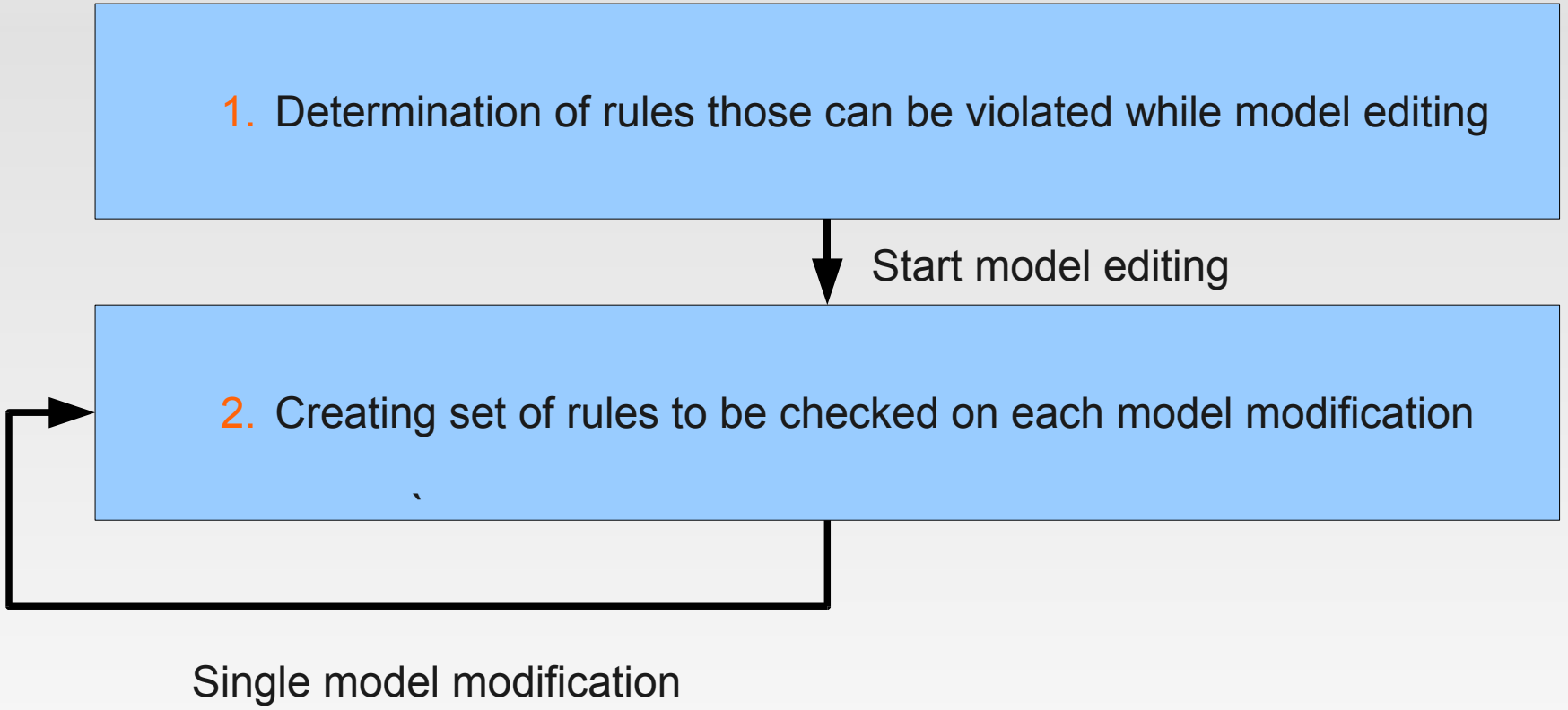
- Designed using *EMF* (*Eclipse Modeling Framework*)
- Automatic creation of classes from the model

Models' Validation (1)

- Basic concepts:
  - Utilization of preliminary calculations
  - Context dependent rules checking
  - Utilization of *OCL* (*Object Constraint Language*) to describe rules

Models' Validation (2)

- Algorithm stages:

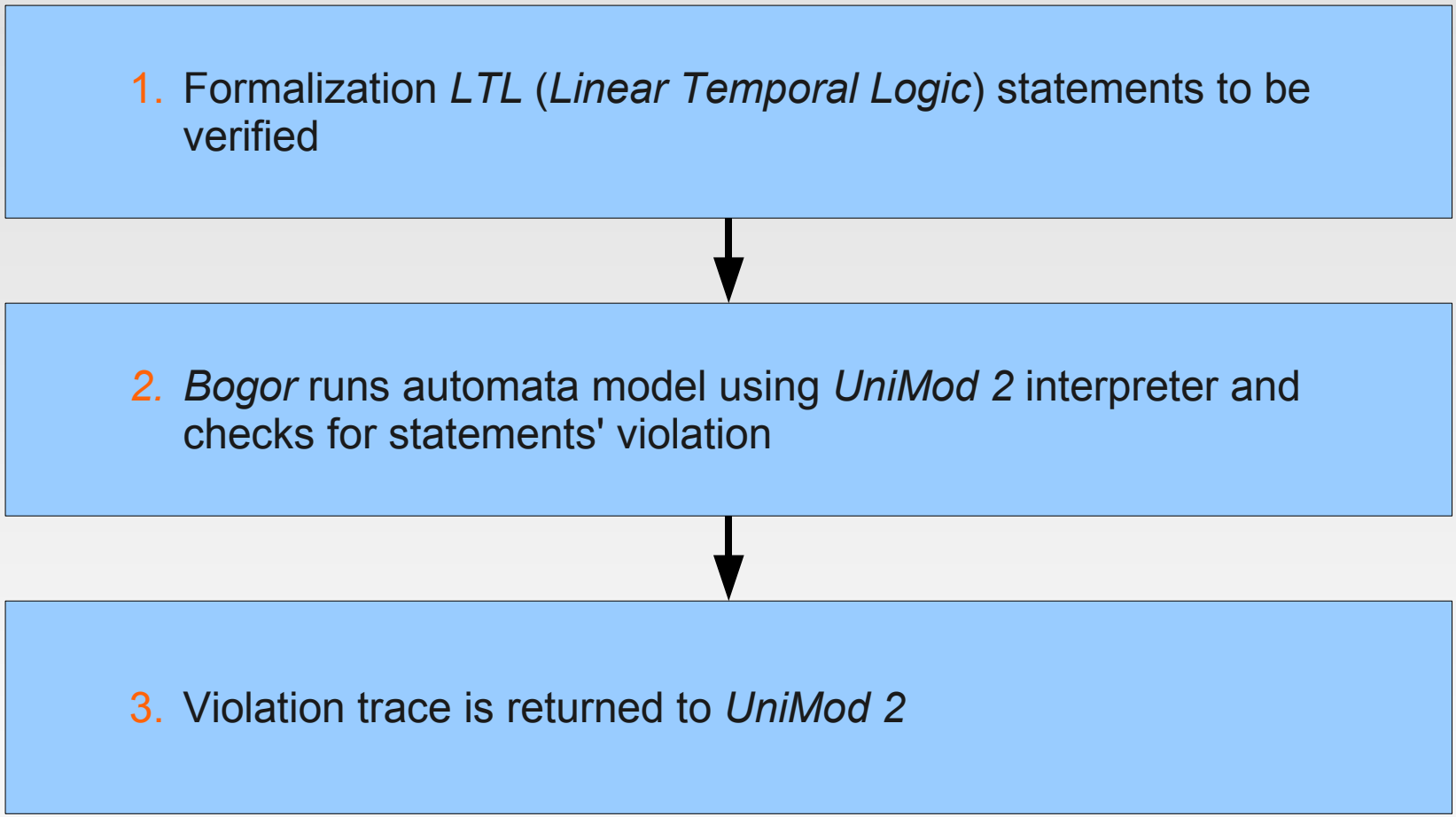


Models' Verification (1)

- Base concepts:
  - Extensible language of *Bogor* verifier (extension for automata language)
  - *UniMod 2* as automata model interpreter
  - Model is not translated into verifier's input language

Models' Verification (2)

- Algorithm stages:



Debugging

- Debugging engine has following abilities:
  - Ability to add breakpoints to states and transitions
  - Ability to execute program step by step
  - Ability to watch value of context variables

Visualization

- Editor based on *GMF* (*Graphical Modeling Framework*)
- Ability to highlight model elements while:
  - Validation
  - Verification
  - Debugging

Summary

- Redesigned and newly introduced components in instrumental tool *UniMod 2*:
  - Data model representation was redesigned
  - Faster validation algorithm was introduced
  - Ability to verify models was introduced
  - Generated editor based on *GMF*
  - Unified system for visualization of actions on model was introduced