

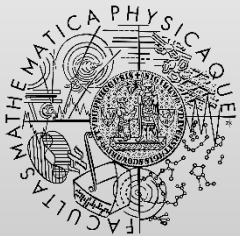
Alloy: Language & Tool

<http://d3s.mff.cuni.cz>

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Distributed and
Dependable
Systems



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Overview

- Modeling language
- Automated analyzer

- Web: <http://alloytools.org/>

- Features
 - Assertions about models (systems)
 - Generating solutions (instances)
 - Visualization of counterexamples

Modeling language

- Fully declarative
- Syntax
 - First-order logic, sets, relations
 - Object-oriented programming
- Behind the scenes: relations & join

Alloy IDE

- Text editor
- Messages

- Visualizations of instances
- Custom themes (style)

Syntax & Example

- Entities: signatures, relations, sets
- Properties: facts, assertions
 - Under-constraining
 - Over-constraining
- Commands: run, check
 - Finite scope (*small scope hypothesis*)

Dynamic behavior

- Multiple versions of the system
- Specifying operations
 - Predicates
 - Functions
- Generating execution traces
 - Linear ordering of states

Final notes

- Limitations: integers, sequences
- Additional examples
- Further reading
 - <http://alloytools.org/documentation.html>