

ProMoBox :

A FRAMEWORK FOR GENERATING DOMAIN-SPECIFIC PROPERTY LANGUAGES

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overview

- ▶ Paper
- ▶ Introduction
- ▶ Problem
- ▶ Solution
- ▶ Limitations and assumptions

Paper

- ▶ Bart Meyers , Romuald Deshayes , Levi Lucio , Eugene Syriani , Hans Vangheluwe , and Manuel Wimmer
- ▶ 2014
- ▶ SLE

introduction

- ▶ DSM specific to problem space
- ▶ Specification and verification of properties
- ▶ Under represented

Problem

- ▶ Specification and verification
- ▶ Needs translation to LTL
- ▶ Contradicting with philosophy

PromoBox

- ▶ generic languages for specifying and verifying temporal properties
- ▶ fully automated specialise and integrate to DSML
- ▶ a verification backbone

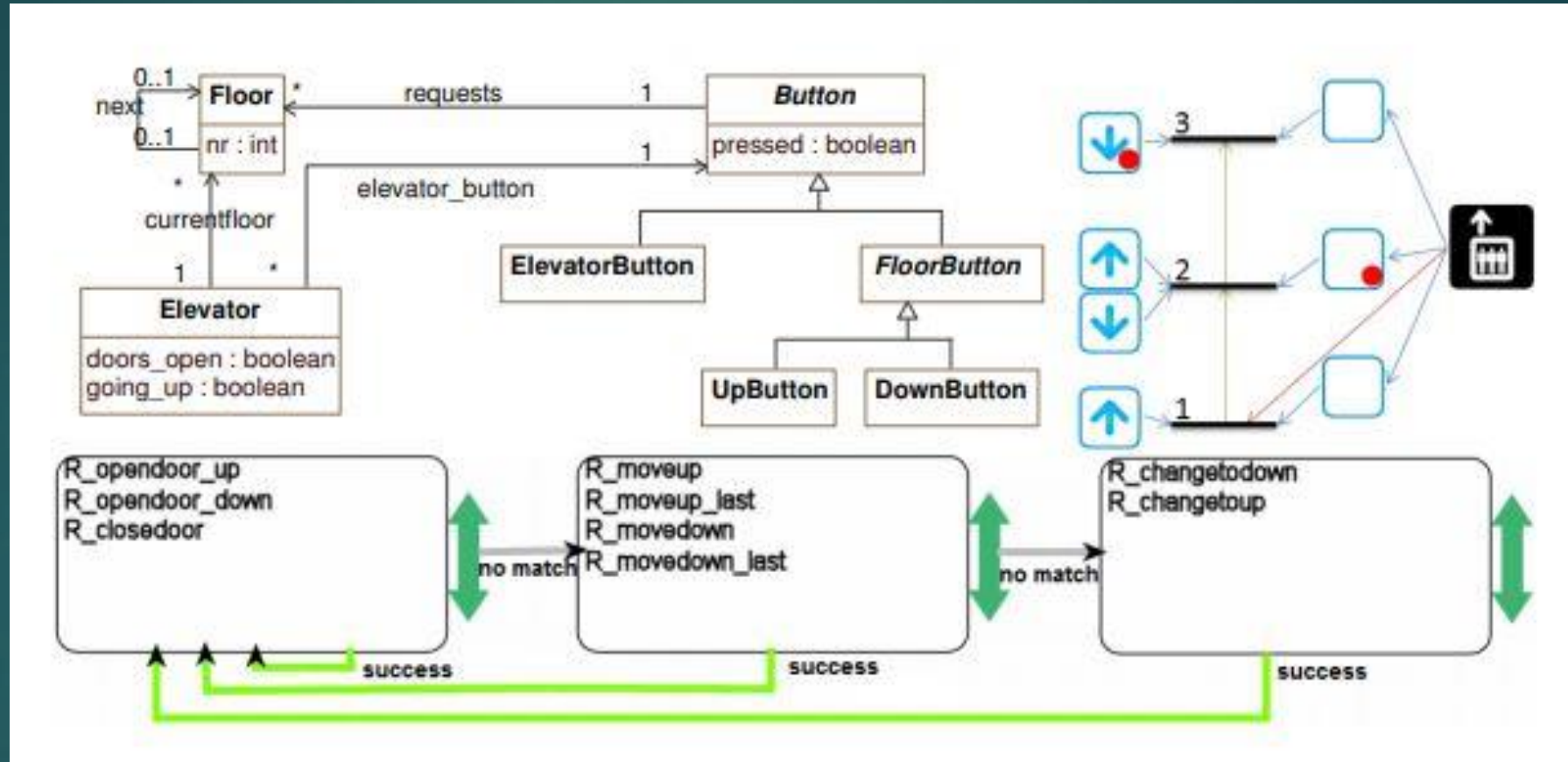
Solution

- ▶ 5 sub-languages:
 - ▶ Design
 - ▶ Run-time state
 - ▶ Event based input
 - ▶ State based output
 - ▶ Property specification

Solution

- ▶ Fully automated
- ▶ Verification Backbone

Solution



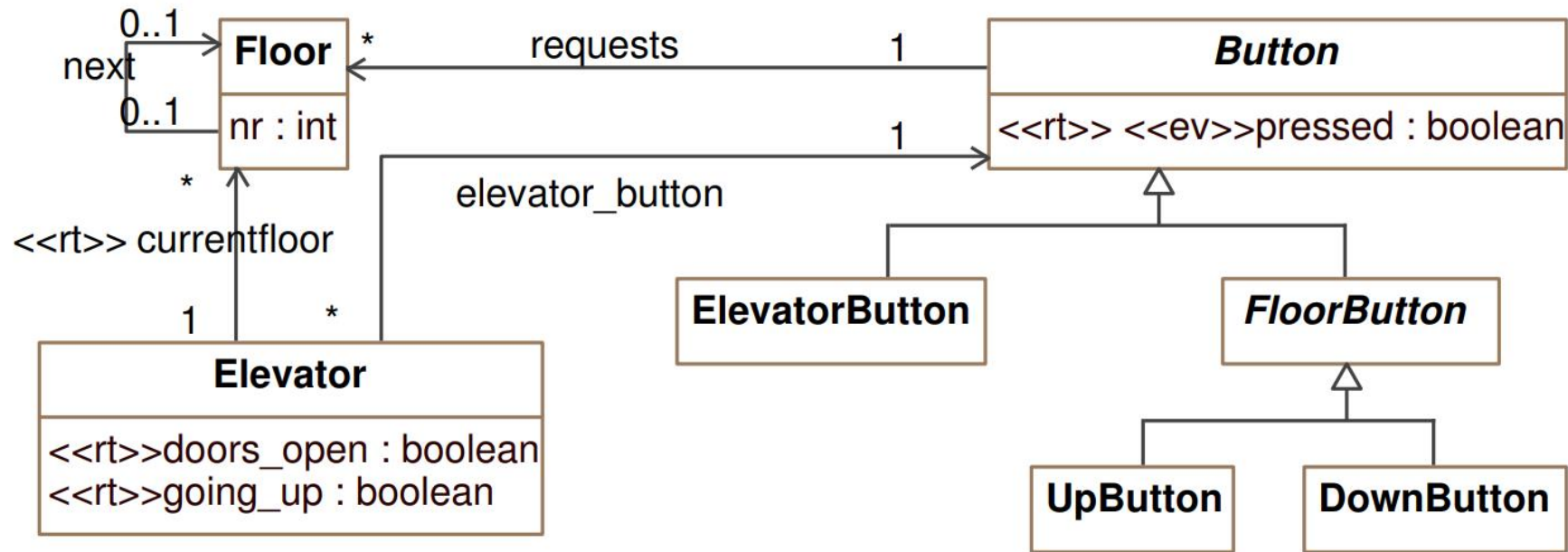
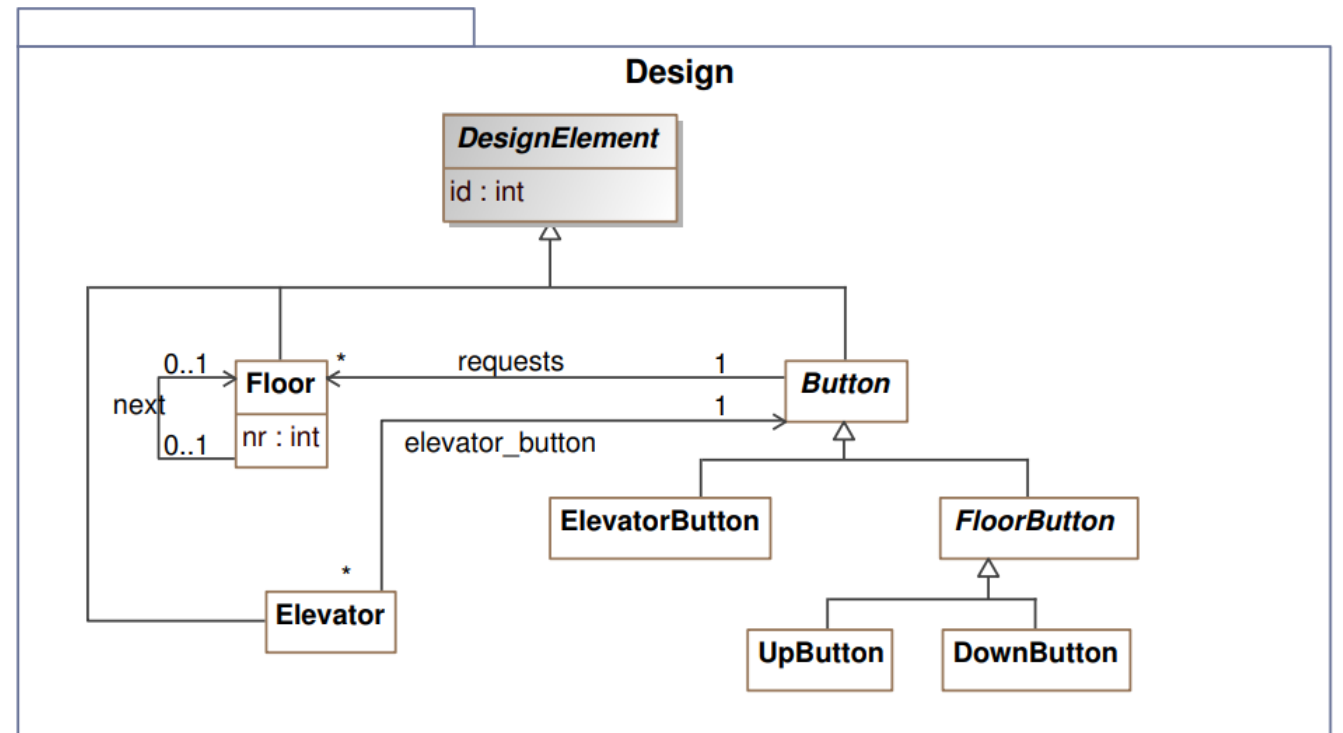
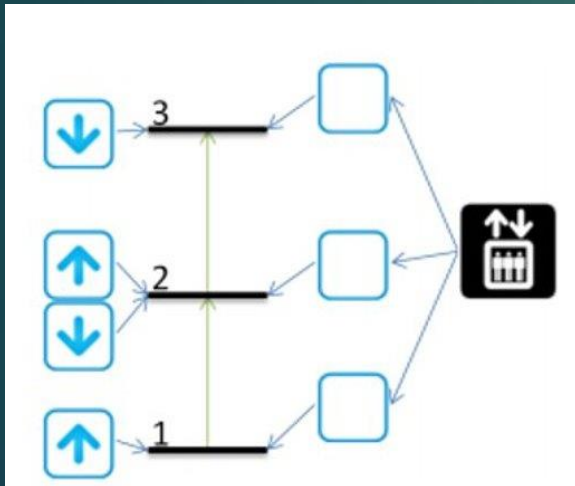


Fig. 3. The annotated metamodel E' .

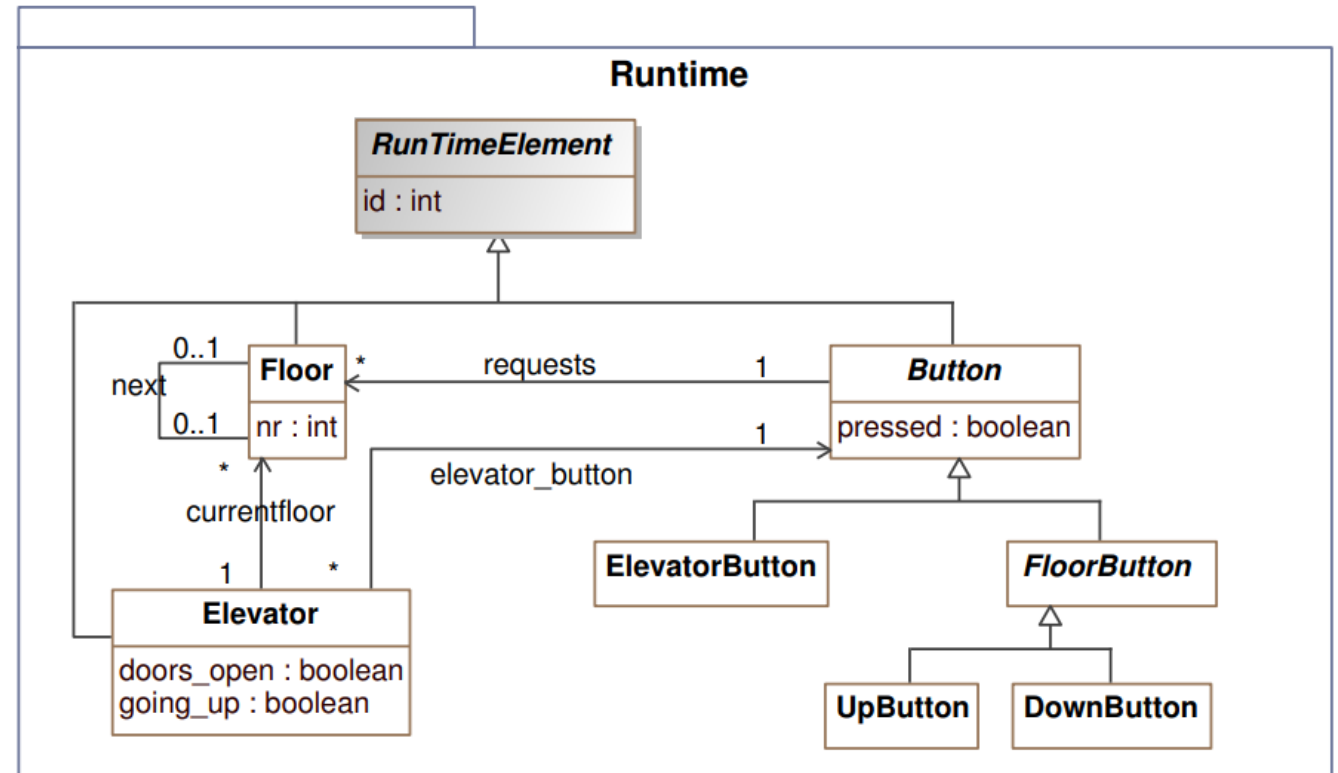
Design

- ▶ Create model



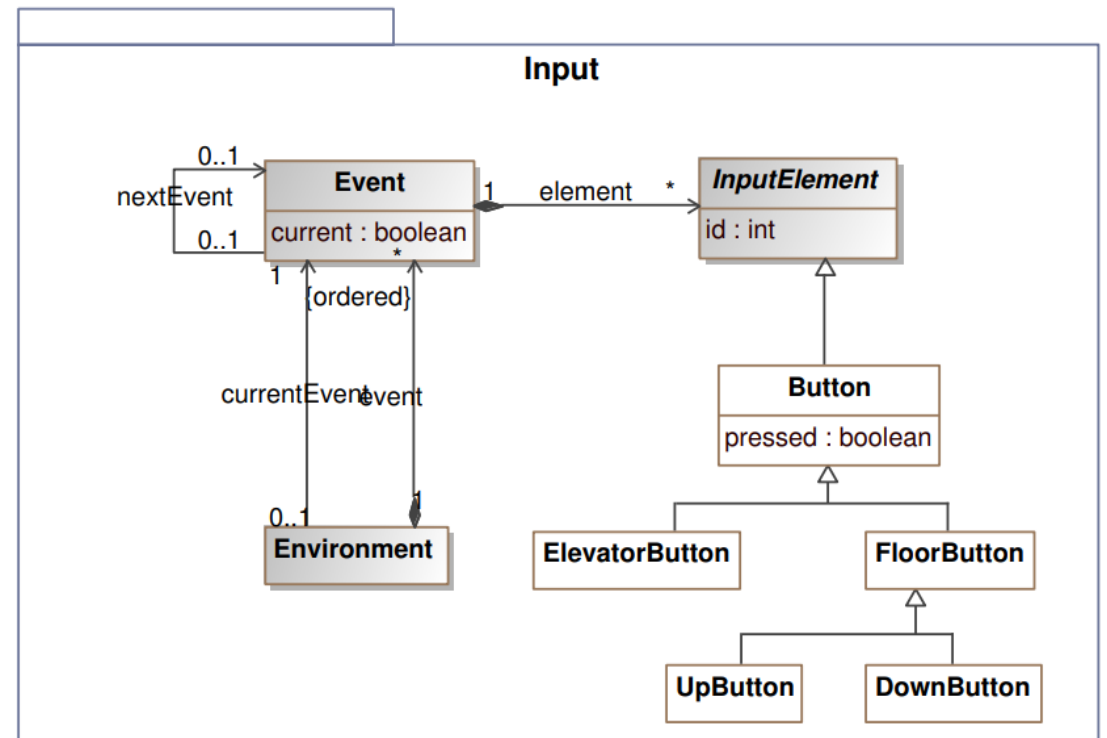
Run Time State

- ▶ Notion of state
- ▶ Usefull for verification
- ▶ traces



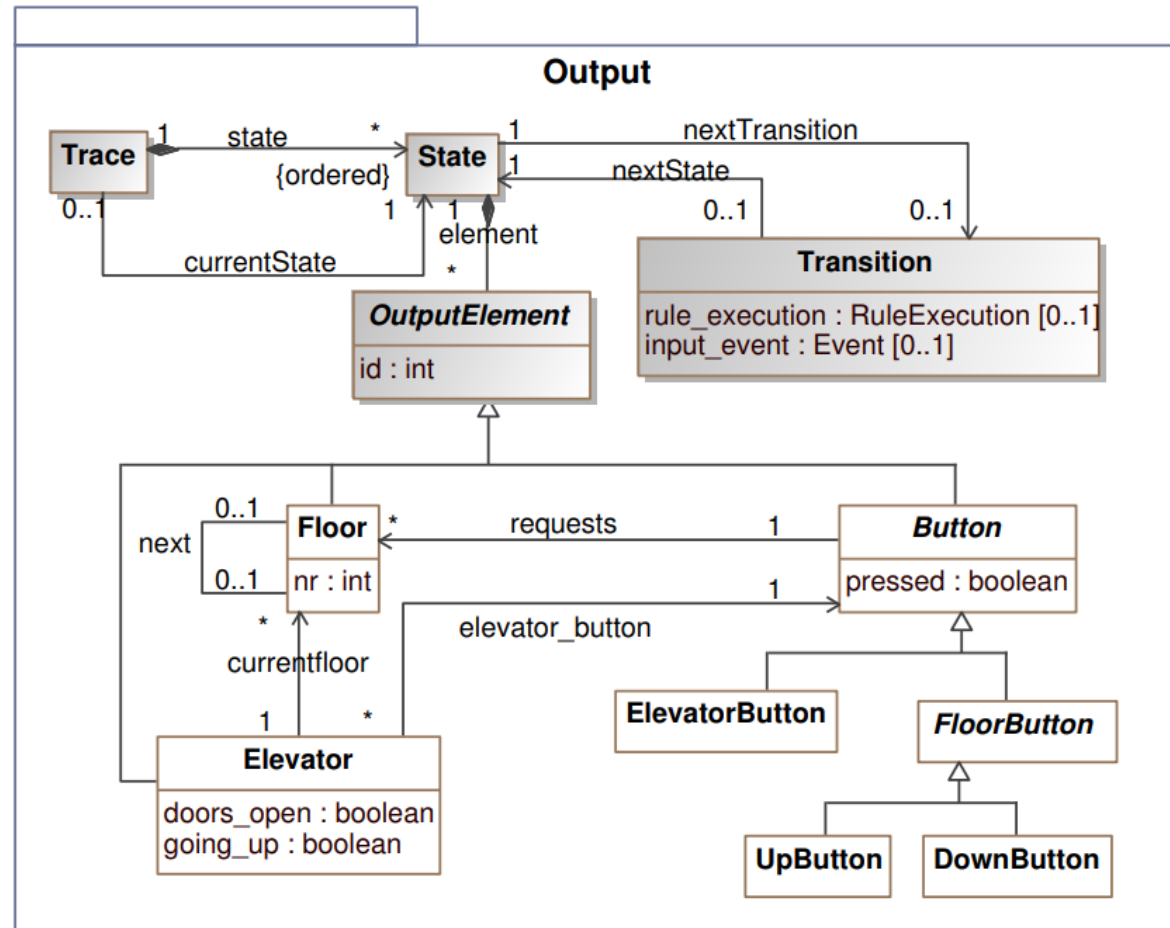
Event based input

- ▶ Marked evt
- ▶ Represents events



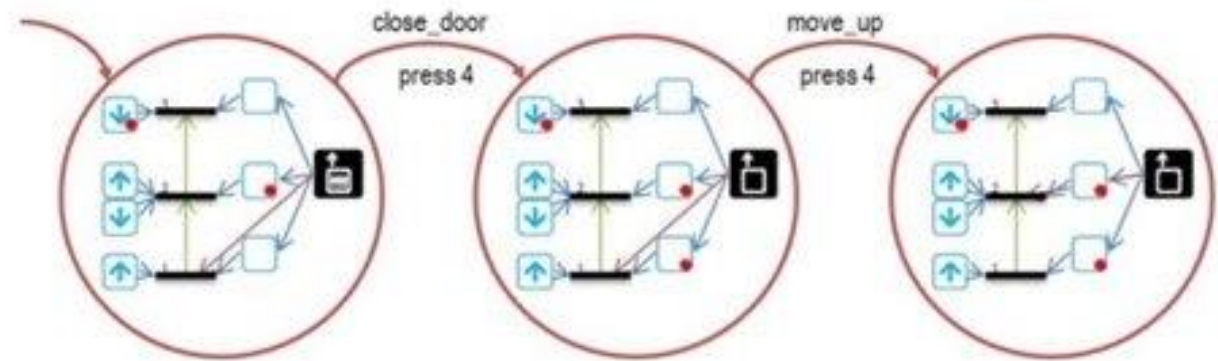
State based output

- ▶ Represent a state the system is in
- ▶ What transition led to this



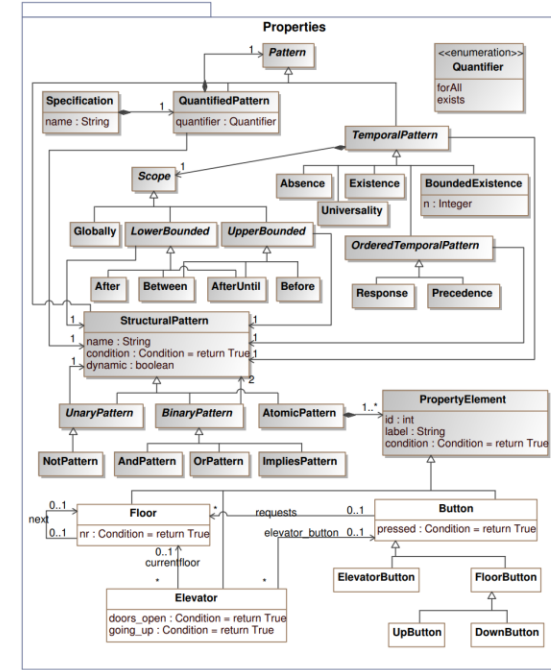
State based output

- ▶ Represent a state the system is in
- ▶ What transition led to this
- ▶ Create traces

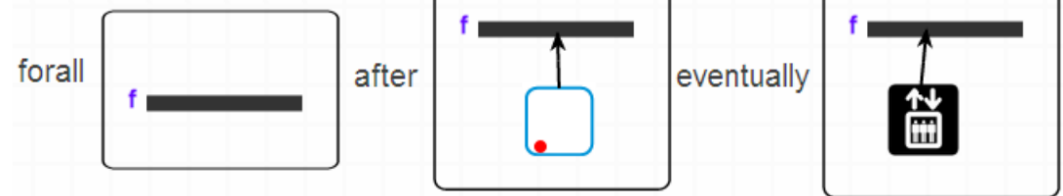


Property specification

- ▶ Create specifications visually
- ▶ Stay inside the problem domain



ReachesFloor



verification

- ▶ Translation to LTL and Promela
- ▶ Verification with SPIN
- ▶ Trace generation by SPIN
- ▶ Transformation of the counter-example to the domain-specific level
- ▶ Animation of the counter-example

Assumptions and Limitations

- ▶ Boundedness
- ▶ Format of the properties
- ▶ Scalability

Questions?

