



MDSD in Teaching

PG SafeBots II: An Experience Report

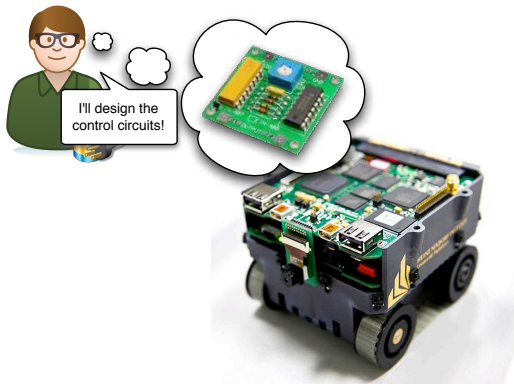


Anas Anis
Sebastian Goschin
Sebastian Lehrig
Christian Stritzke
Thomas Zolynski

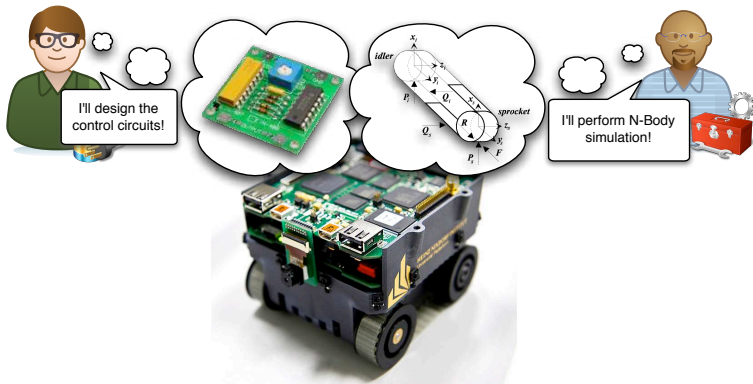
Motivation



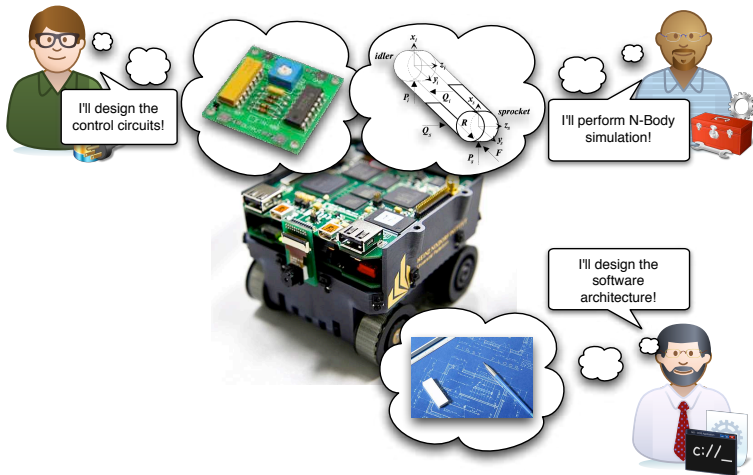
Motivation

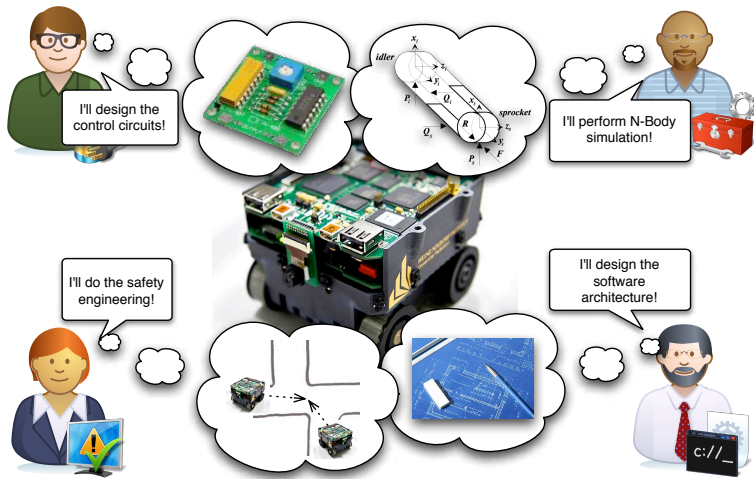


Motivation

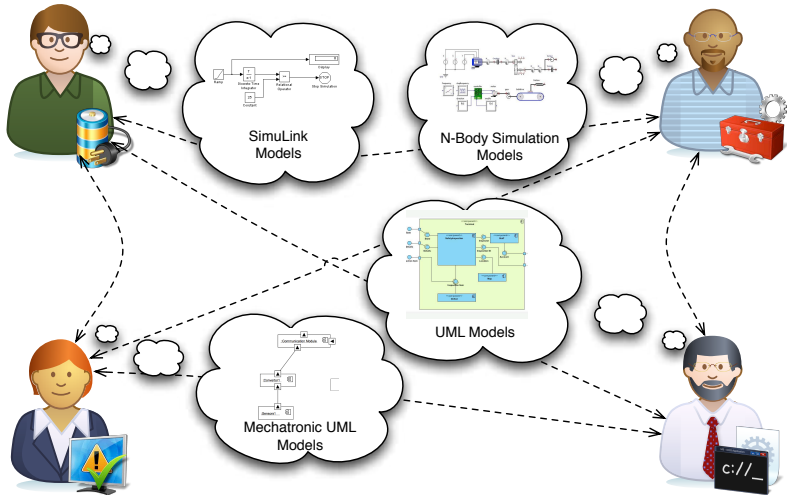


Motivation



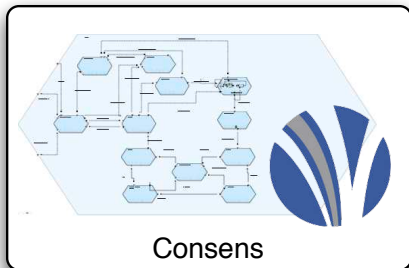


Motivation



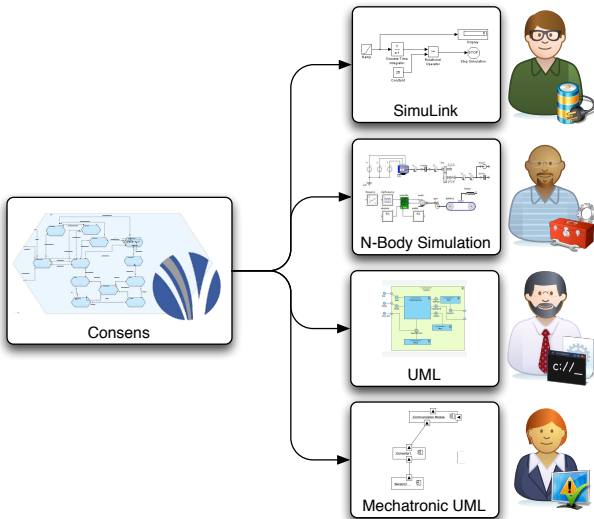
Motivation

Model Synchronization



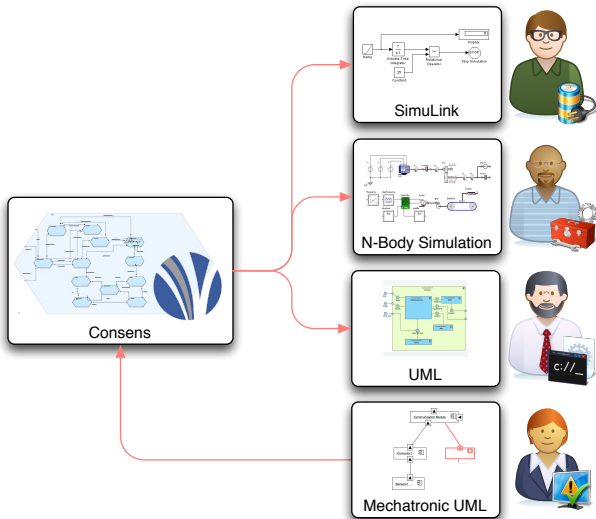
Motivation

Model Synchronization



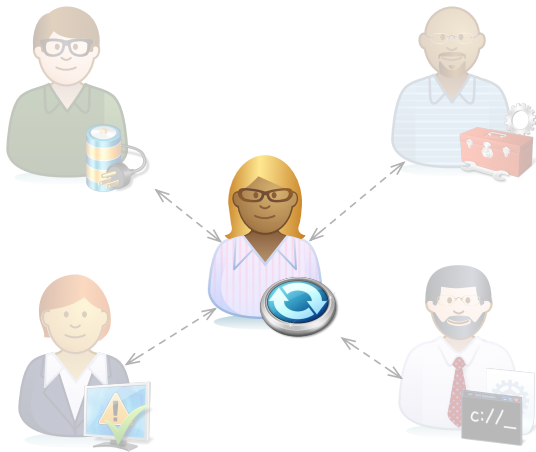
Motivation

Model Synchronization

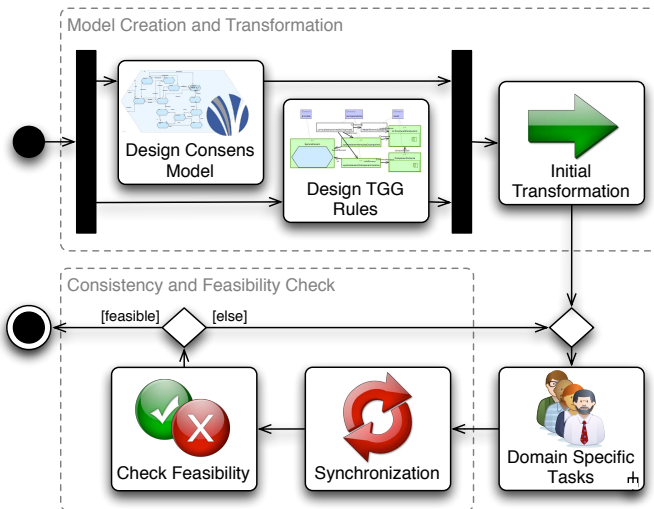


Motivation

Model Synchronization

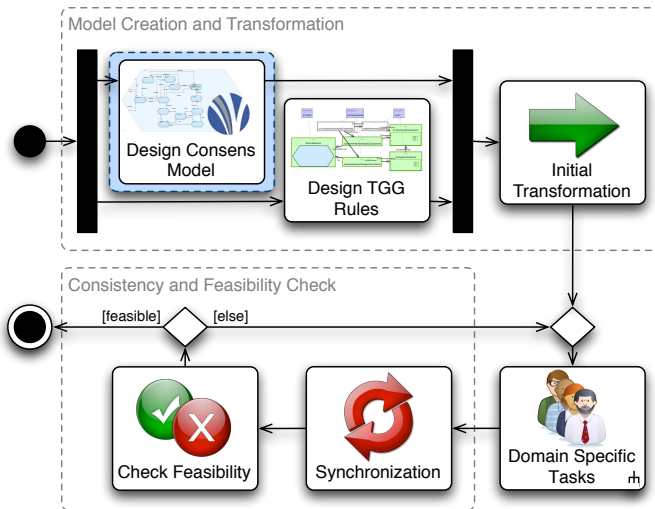


Development Process Overview



Development Process

Design Consensus Model



Development Process

BeBot Model



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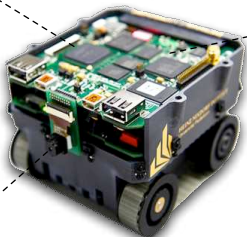
Communication



GPS

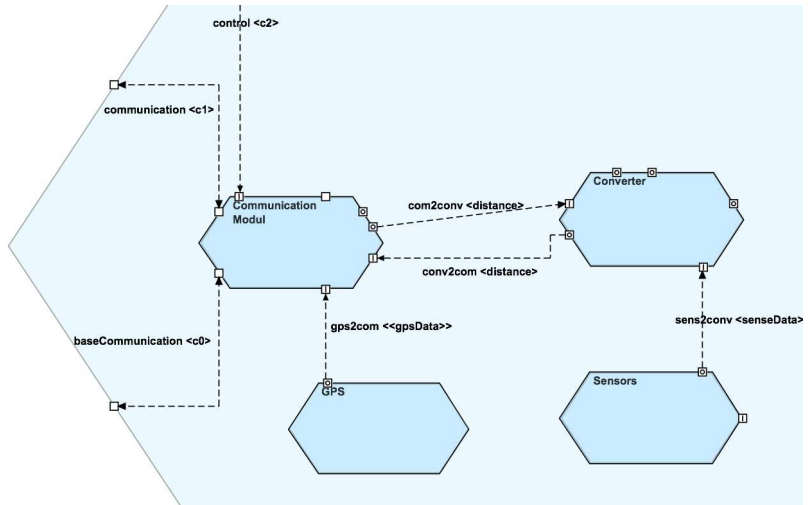


Sensor



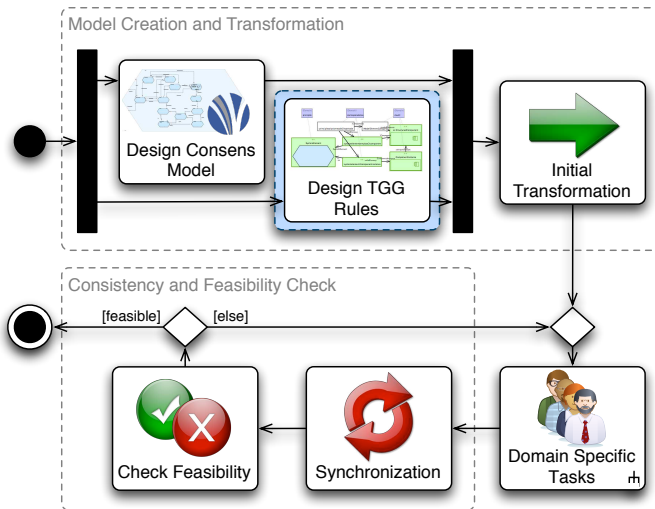
Development Process

Design Consensus Model



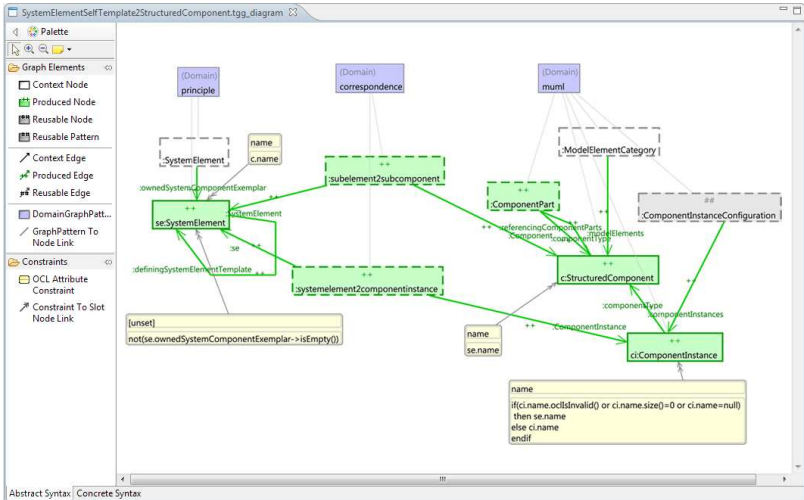
Development Process

Design TGG Rules



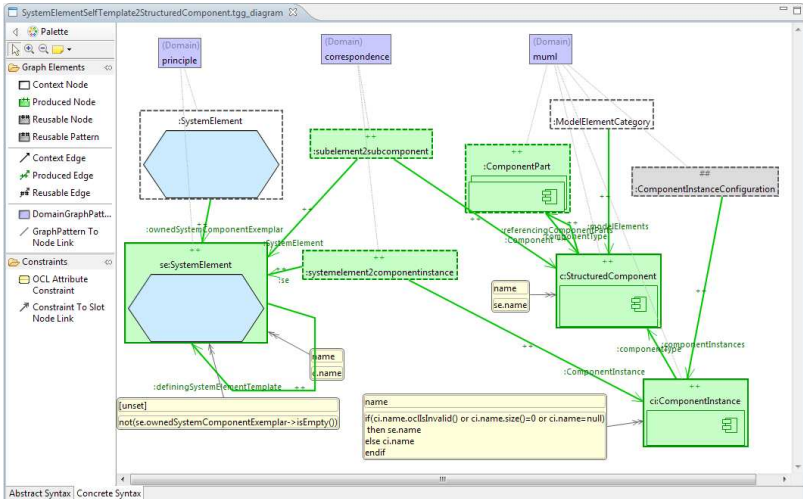
Development Process

Abstract Syntax Editor



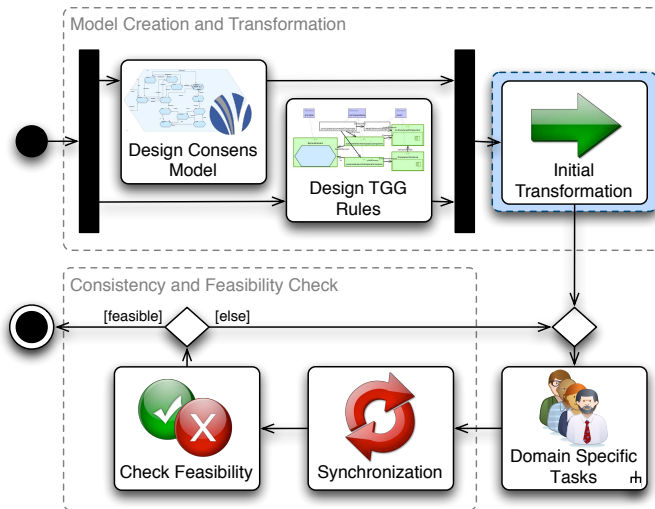
Development Process

Concrete Syntax Editor



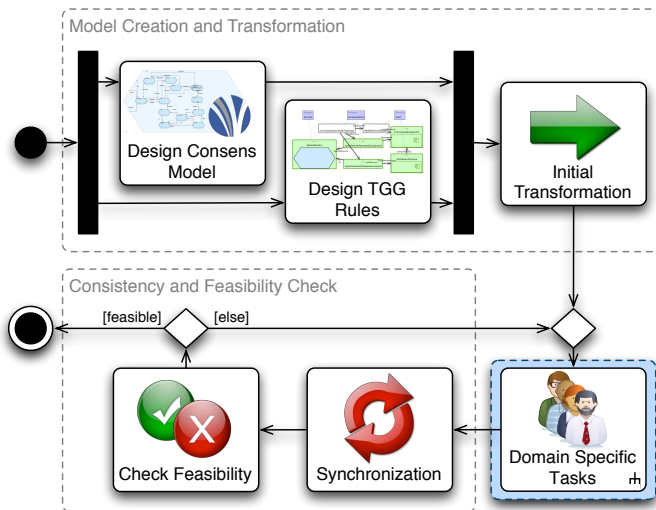
Development Process

Initial Transformation



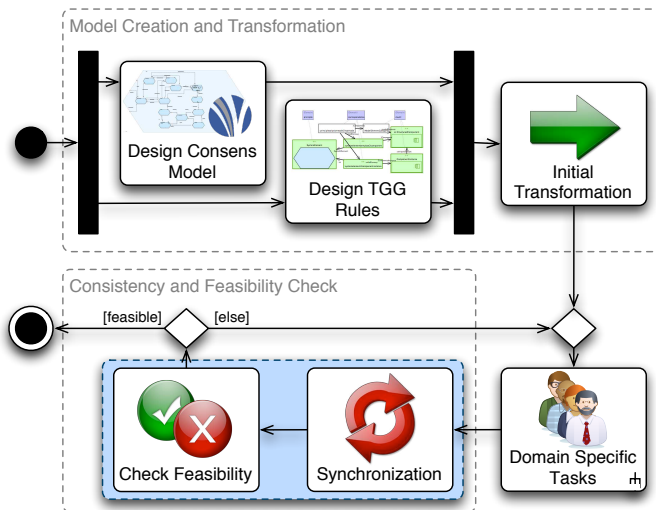
Development Process

Domain Specific Tasks



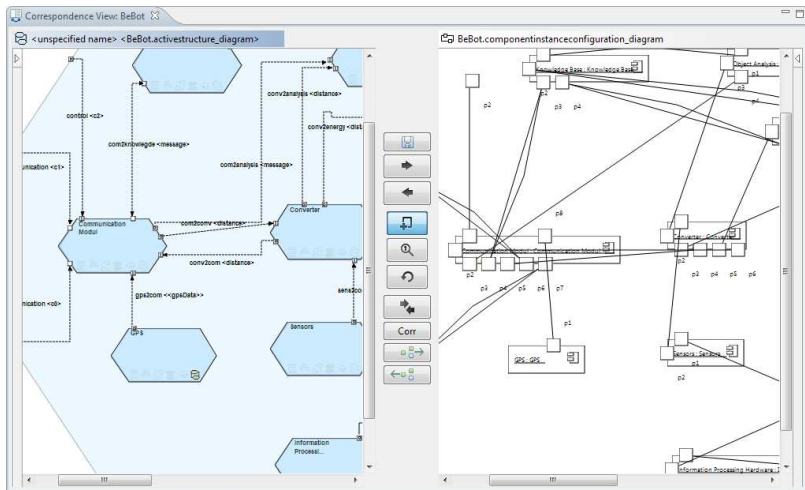
Development Process

Synchronization



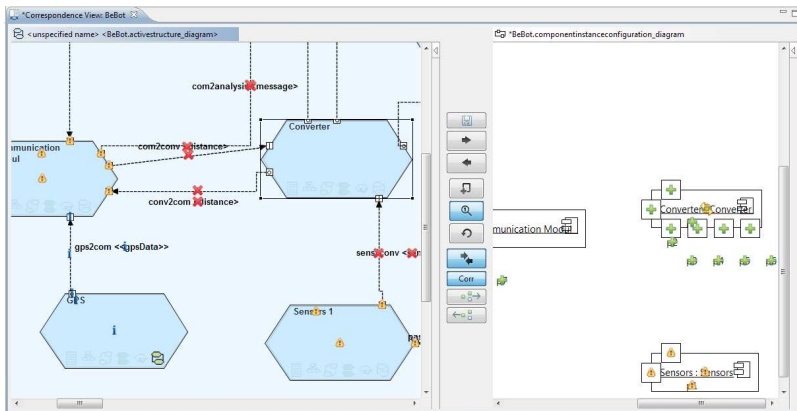
Development Process

Correspondence View



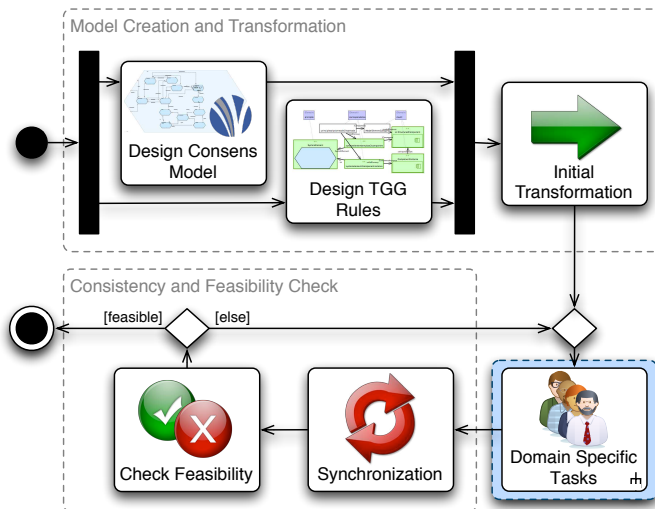
Development Process

Correspondence View



Development Process

Example: Domain Specific Tasks

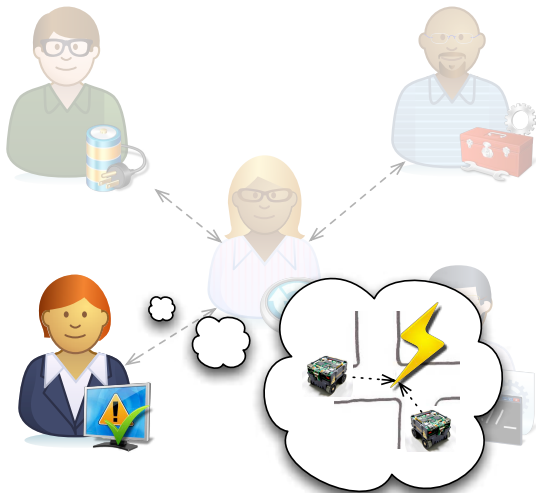


Hazard Analysis

Motivation



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Jun.-Prof. Dr.-Ing. Steffen Becker



Hazard Analysis

Motivation



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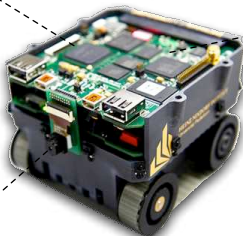
Communication



GPS

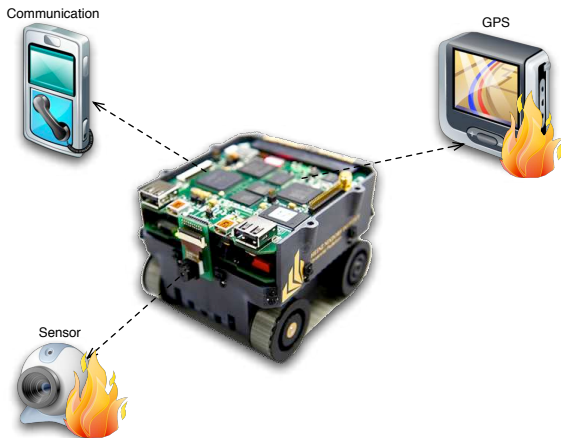


Sensor



Hazard Analysis

Motivation

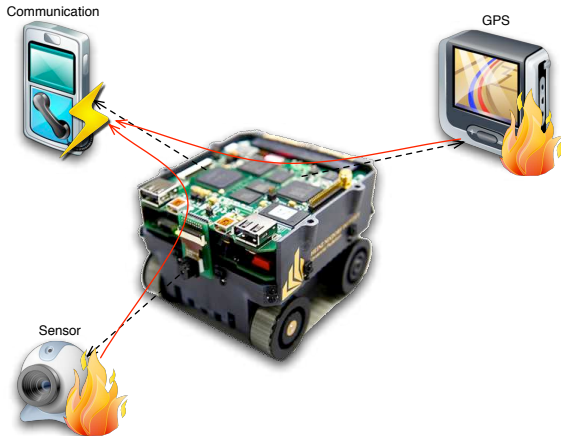


Hazard Analysis

Motivation

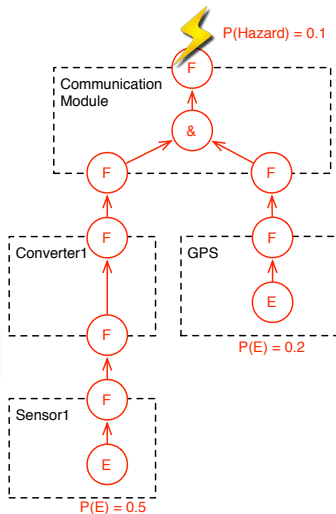
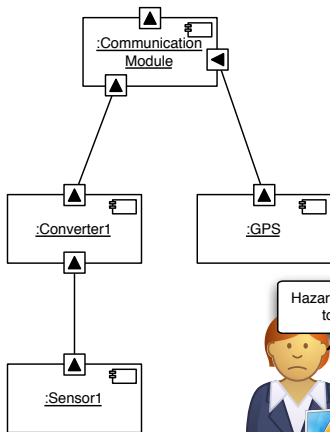


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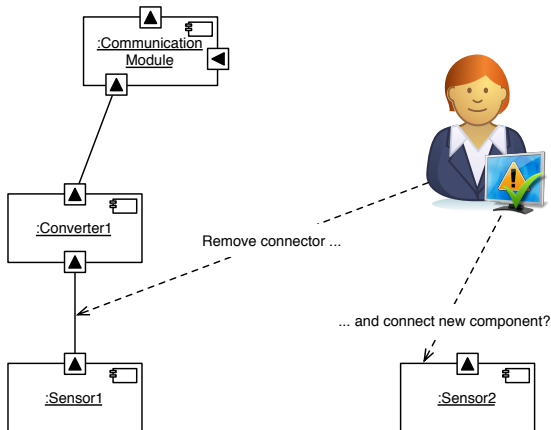
Hazard Analysis

Result of a Hazard Analysis



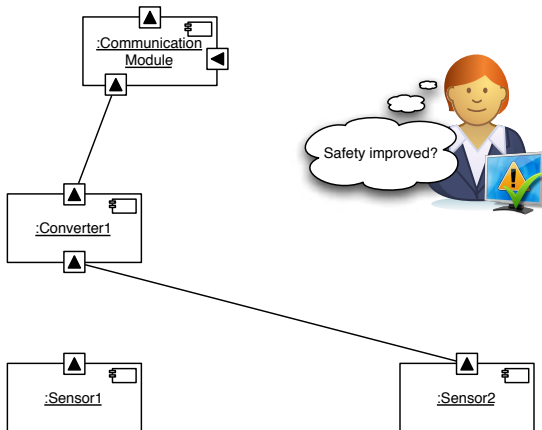
Hazard Analysis

Idea 1



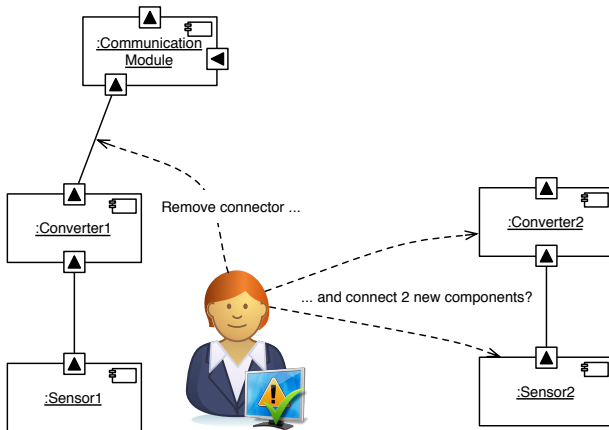
Hazard Analysis

Idea 1



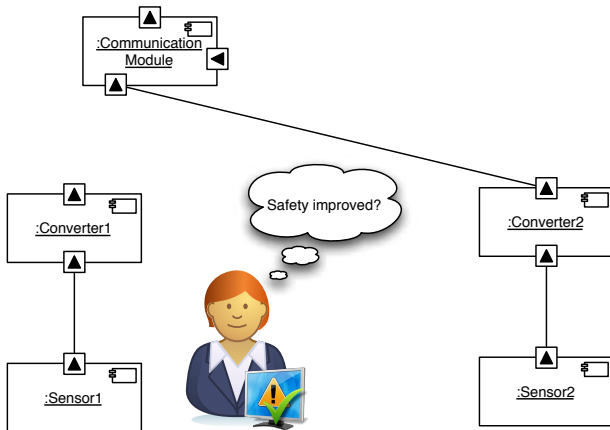
Hazard Analysis

Idea 2



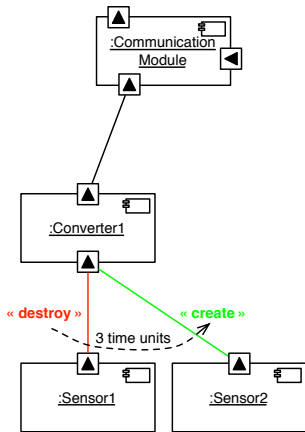
Hazard Analysis

Idea 2

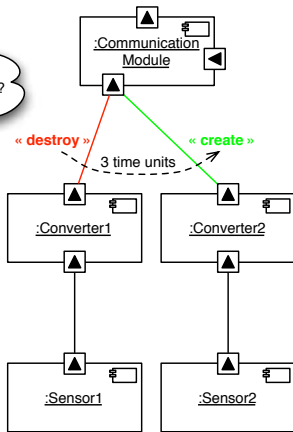


Hazard Analysis

Time



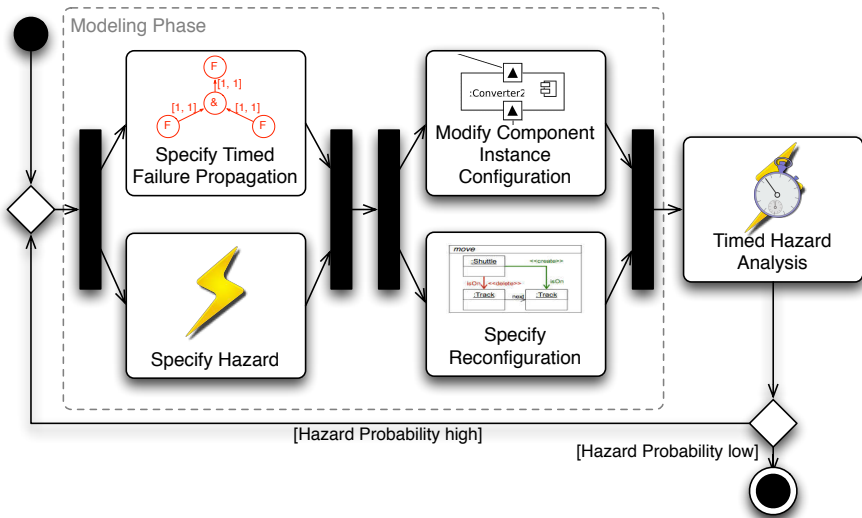
Idea 1



Idea 2

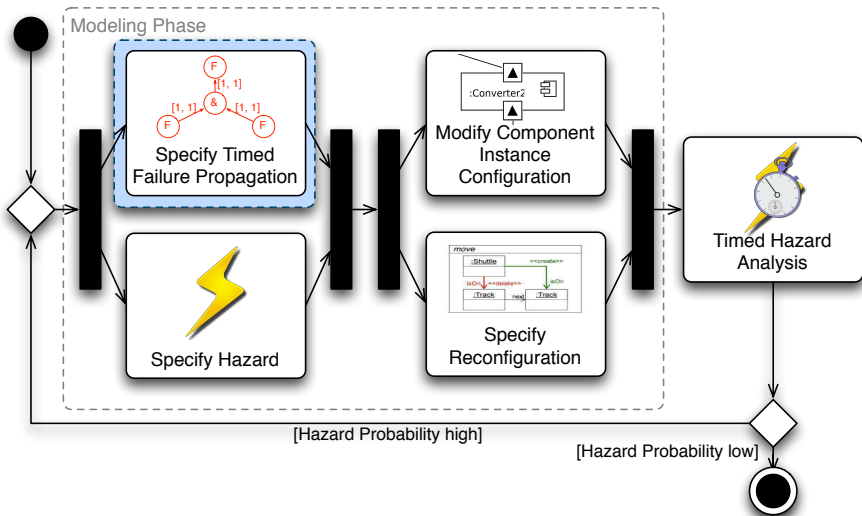
Timed Hazard Analysis

General Process (Simplified)



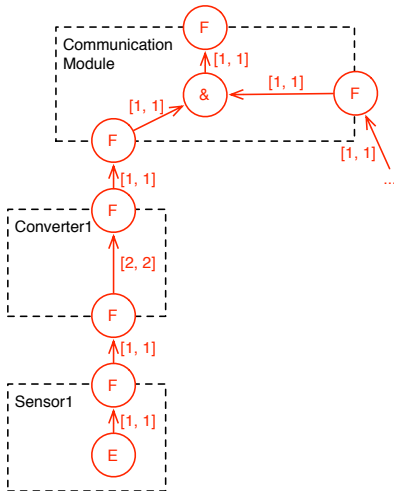
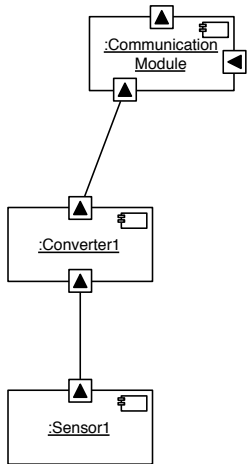
Timed Hazard Analysis

Specify Timed Failure Propagation



Timed Hazard Analysis

Specify Timed Failure Propagation Graph (TFPG)



Timed Hazard Analysis

Specify Timed Failure Propagation Graph (TFPG)



Component: Communication Modul

ValueFailure on Communication Modul in p6<=> (ValueFailure on Communication Modul in p8 [1,1] && ValueFailure on Communication Modul in p5 [1,1]) [1,1]

Available Literals

ValueFailure on Communication Modul
ValueFailure on Communication Modul
ValueFailure on Communication Modul
ValueFailure on Communication Modul

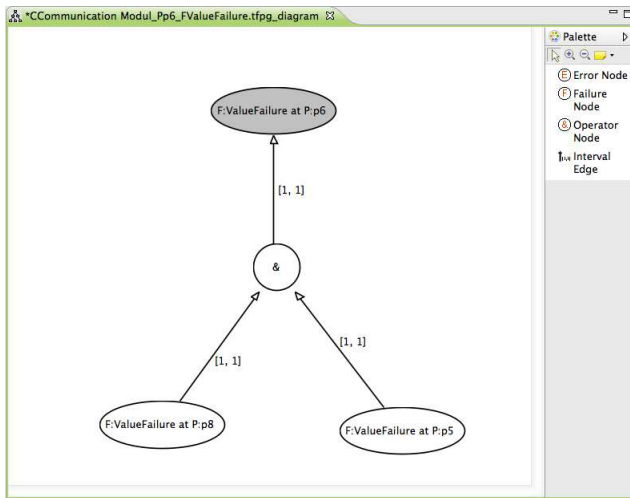
Save

Add Literal

(AND OR NOT <=>) [,]

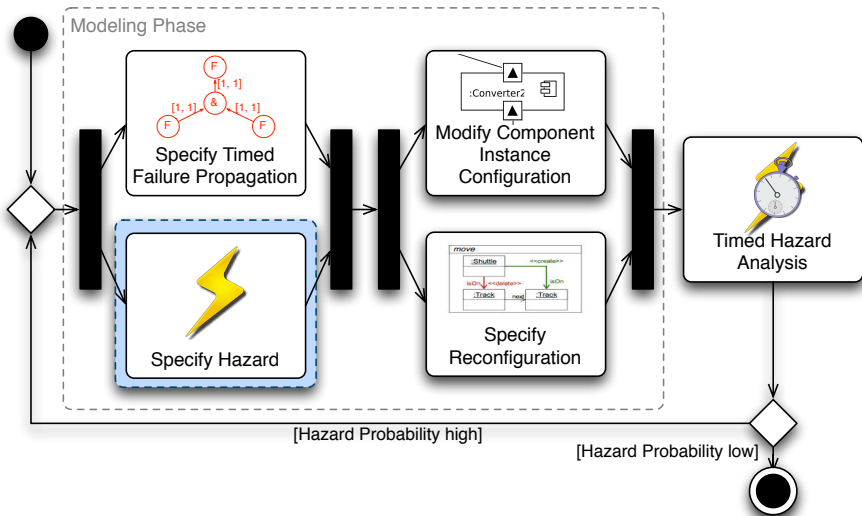
Timed Hazard Analysis

Specify Timed Failure Propagation Graph (TFPG)



Timed Hazard Analysis

Specify Hazard

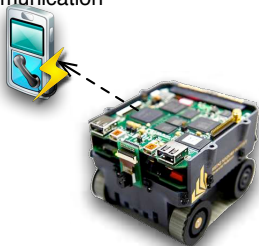


Timed Hazard Analysis

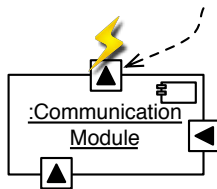
Specify Hazard



Communication

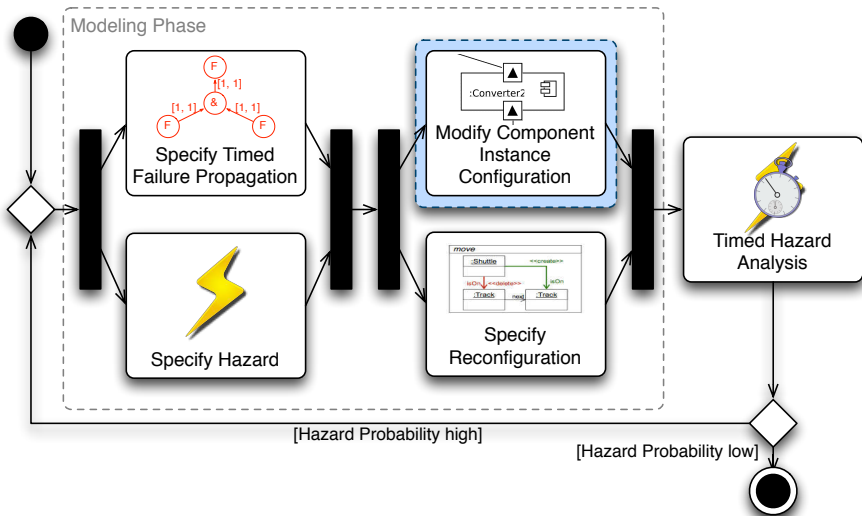


hazard $\Leftrightarrow$ failure on this port



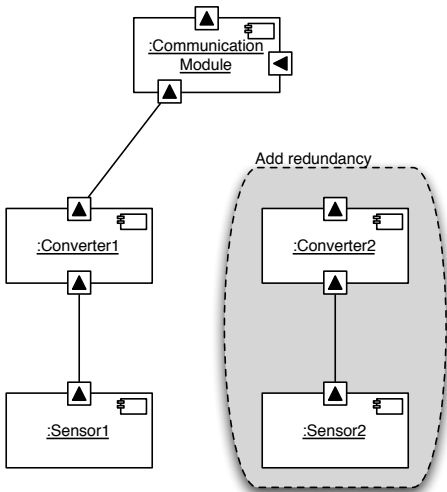
Timed Hazard Analysis

Modify Component Instance Configuration



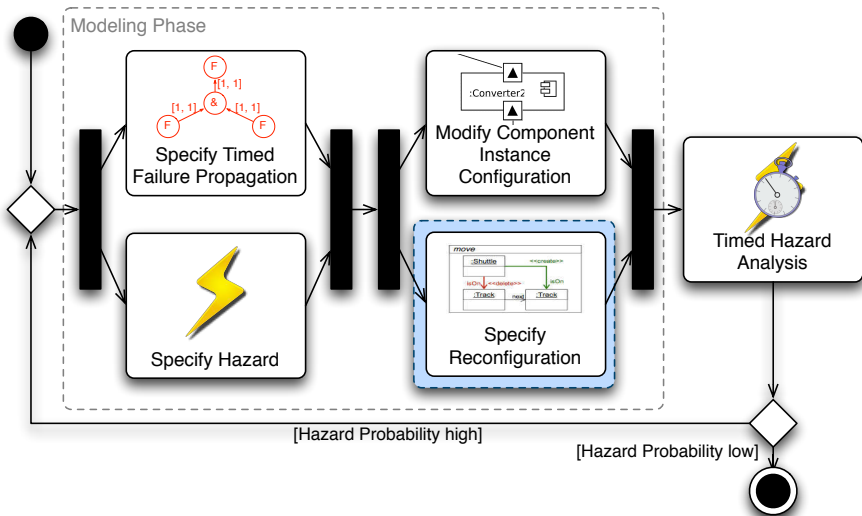
Timed Hazard Analysis

Modify Component Instance Configuration



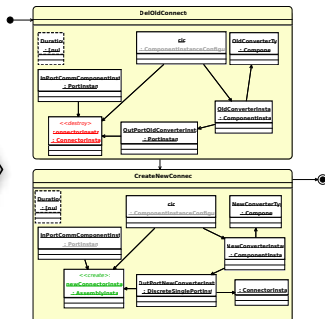
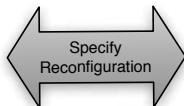
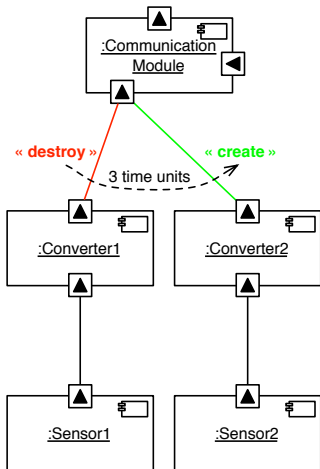
Timed Hazard Analysis

Specify Reconfiguration

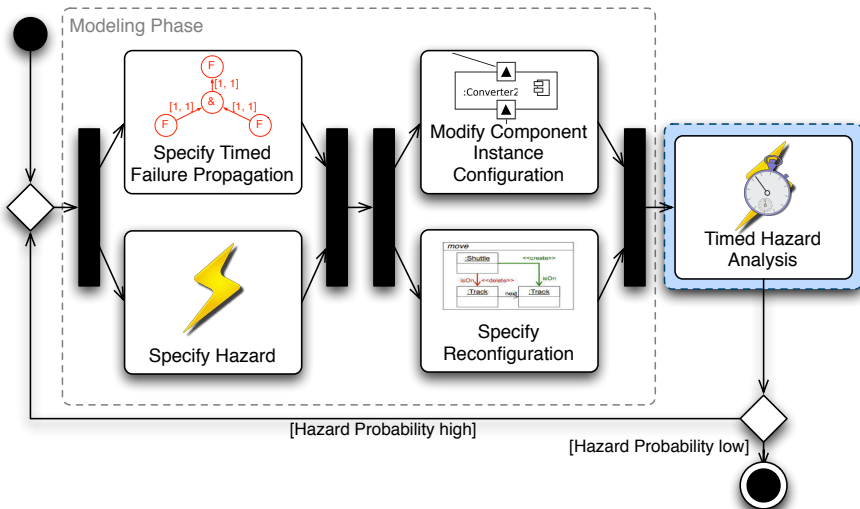


Timed Hazard Analysis

Specify Reconfiguration



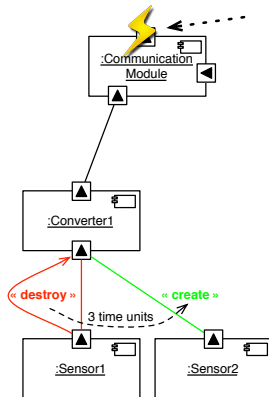
Timed Hazard Analysis Algorithm



Timed Hazard Analysis Algorithm

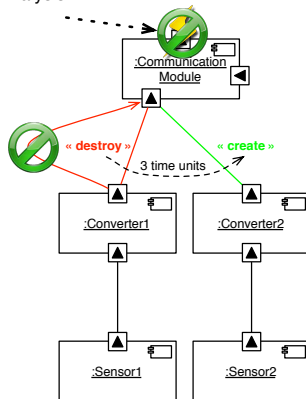


Timed Hazard Analysis
results



Idea 1:

Failure propagation
over connector
(within 3 time units)

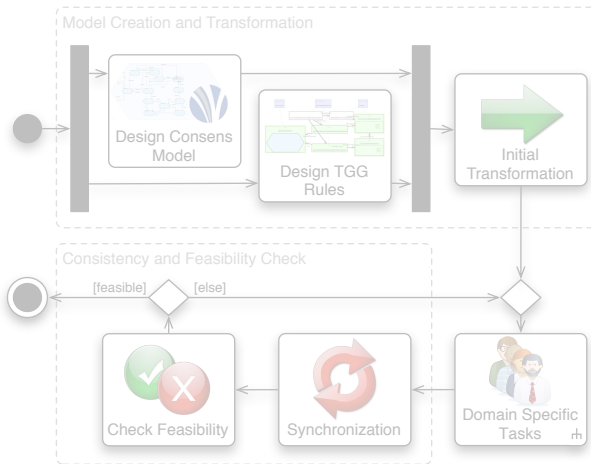


Idea 2:

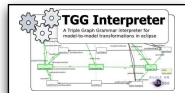
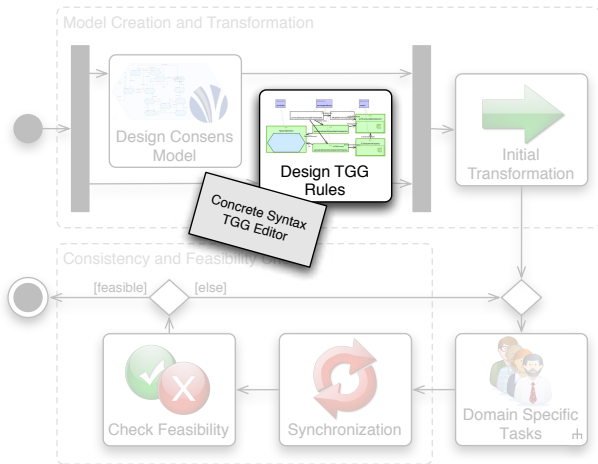
No failure propagation
over connector
(within 3 time units)



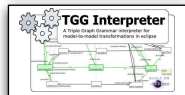
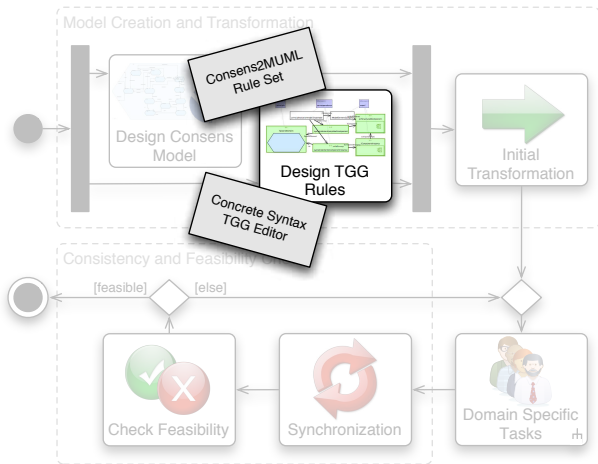
Conclusion



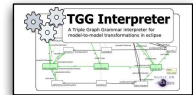
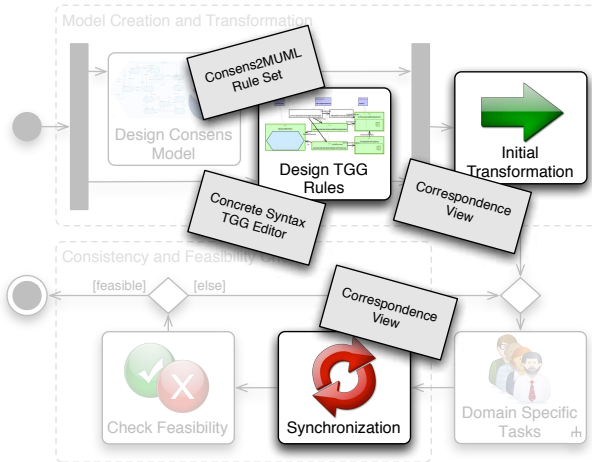
Conclusion

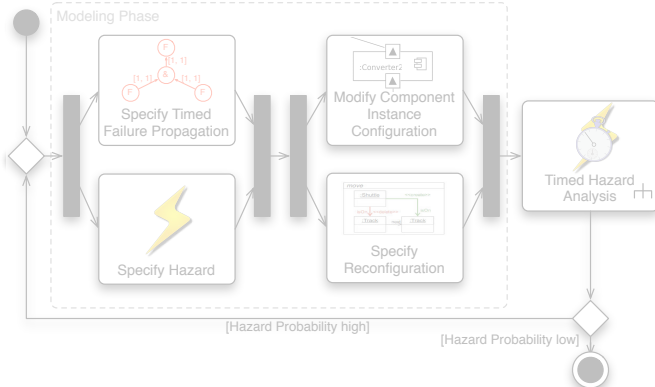


Conclusion

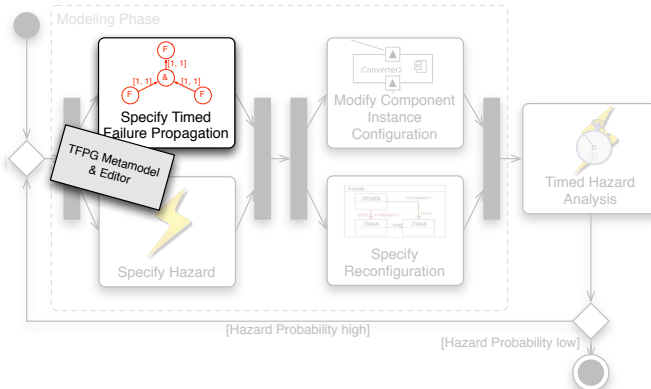


Conclusion

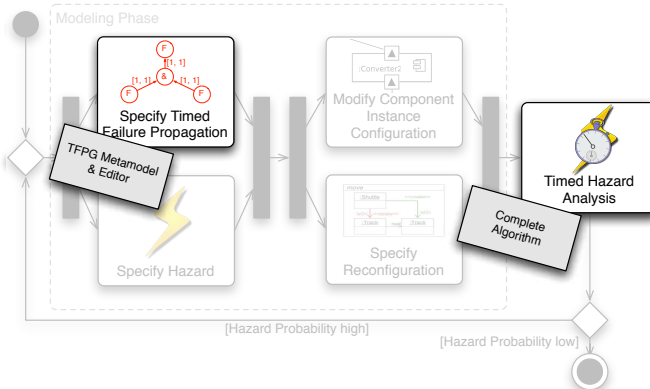




Conclusion



Conclusion



Thanks for your attention



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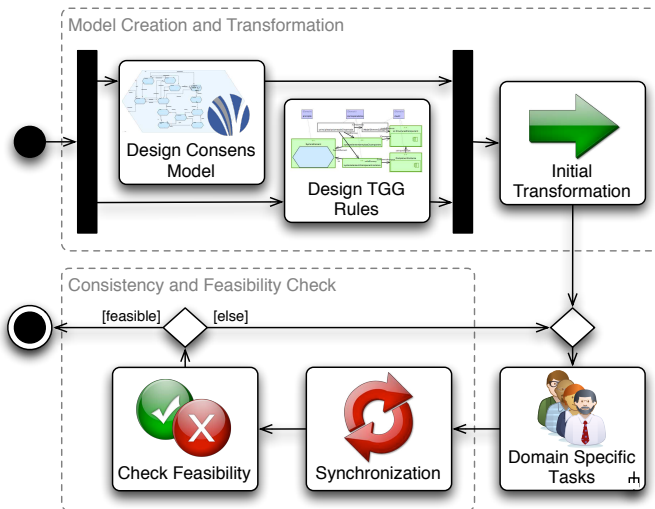
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Development Process Overview



Timed Hazard Analysis

General Process (Simplified)

