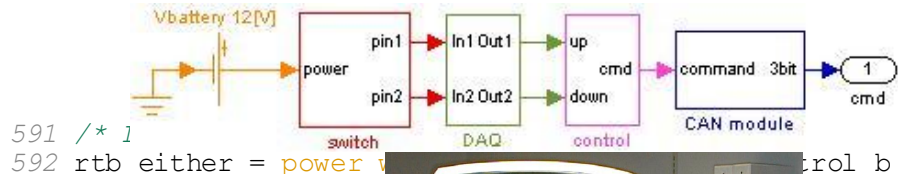
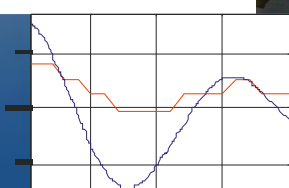


# Fifteen years in the trenches :)



```

591 /* 1
592 rtb_either = power_w
593 || power_window_con
594
595 /* Logic: '<S13>/al
596 * Inport: '<Root>/d
597 * Logic: '<S13>/ove
598 */
599 rtb_temp34 = power_w
600 && (~(rtb_either));
    
```



Pieter J. Mosterman  
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Senior Research Scientist  
 The MathWorks, Inc.

# Career

- M.Sc. in Electrical Engineering of the University of Twente (1991)
  - “Structured Specification for Control System Implementation”
- Ph.D. in Electrical and Computer Engineering of Vanderbilt University (1997)
  - “Hybrid Bond Graphs and Their Application to Diagnosis”
- DFG Postdoc at the German Aerospace Center (2001)
  - Differential and algebraic equation based modeling
- Senior Research Scientist at The MathWorks
  - Model-Based Design

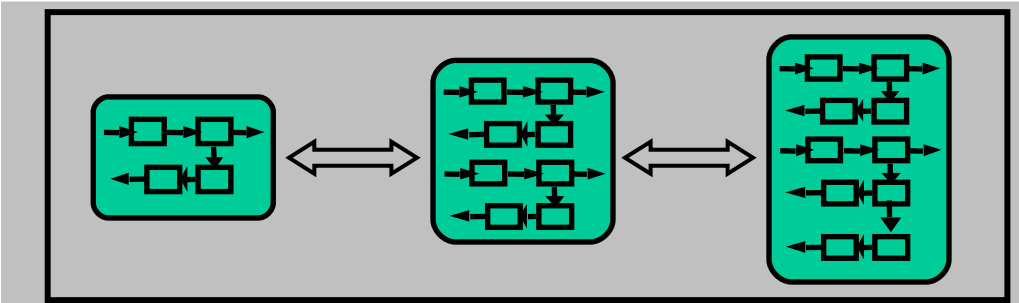
# Model-Based Design (~MDD?)

Requirements and Specifications



Excel  
Word  
Scenario diagrams

↕  
Functionality



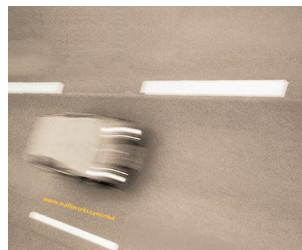
Block diagrams  
Statecharts  
Hybrid Automata  
Bond graphs

↕  
Implementation



C/C++  
Java  
HDL  
ASM

↕  
Test and Verification

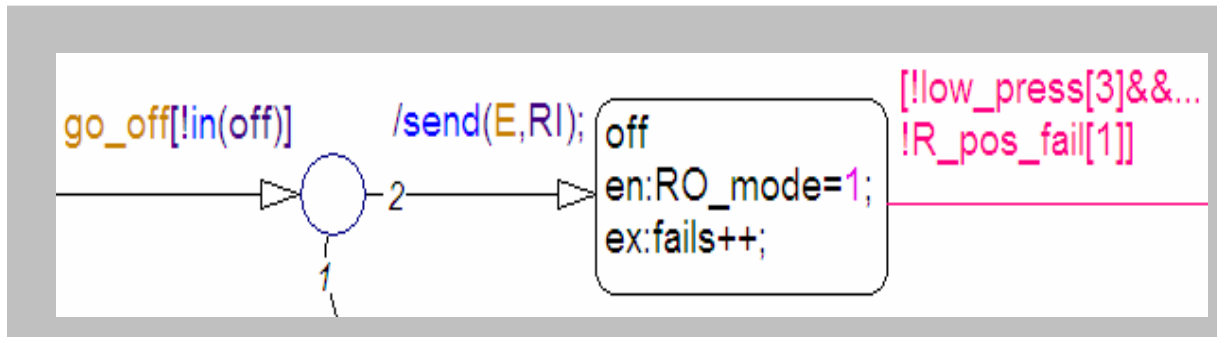
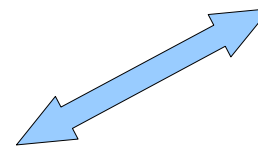
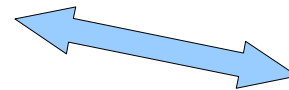
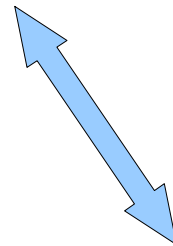
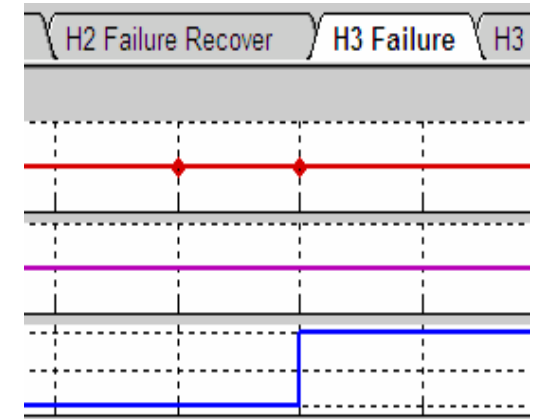


DEVS  
Automata  
Numerical Values  
Polynomials

# Model analysis

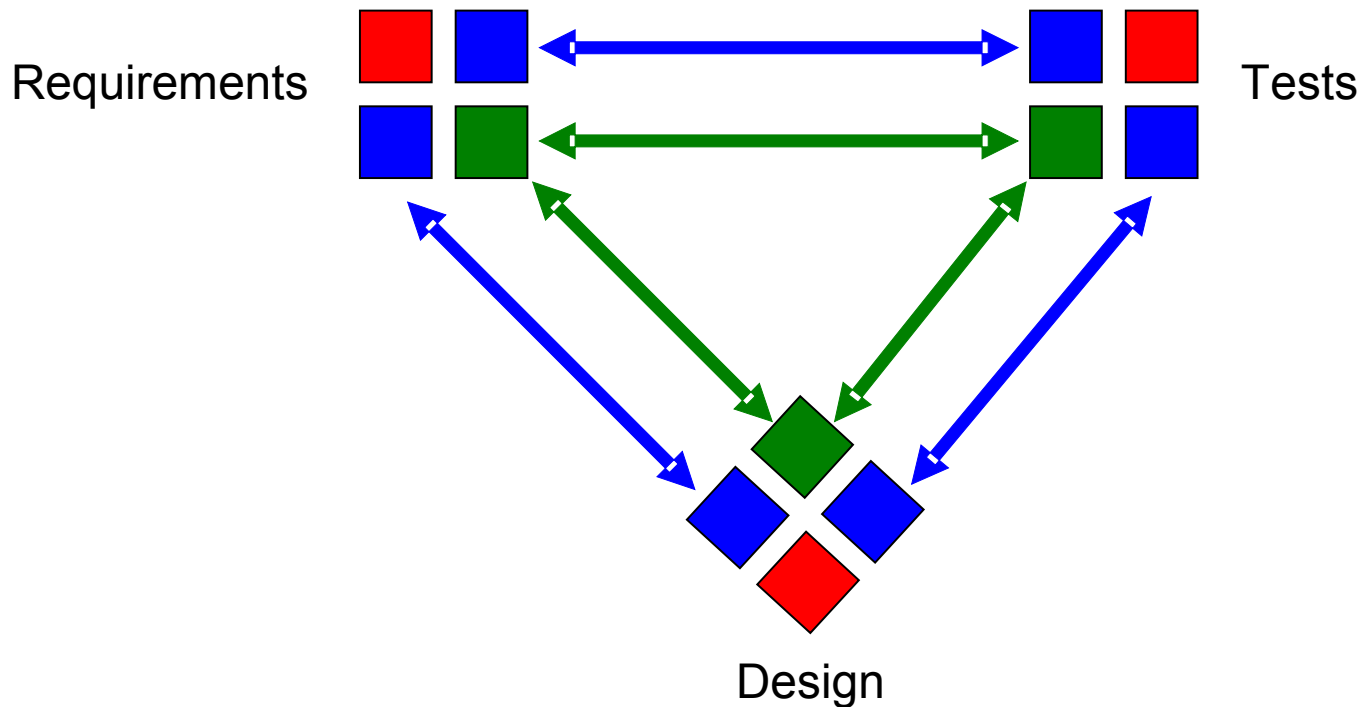
## 2.1.5 Hydraulic pressure 3 failure

If a failure is detected in the hydraulic pressure 3 system, while there are no other failures, isolate the fault by switching the Right Outer actuator to the off mode.



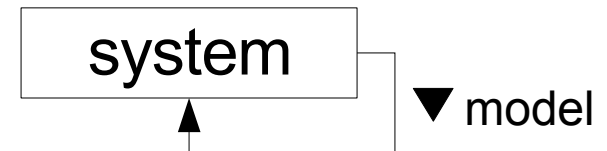
# Yet another design triangle

- Complete ■
- Lacking ■
- Superfluous ■



# My Interests

- Foundation
  - Computational modeling
  - Simulation (quantitative/qualitative)
  - Design/Analysis/Synthesis
- Applications
  - Fault detection and isolation
  - Computer aided instruction
  - Embedded and control system design
- Domains
  - Aerospace
  - Automotive
  - Process industry
  - Chip design



# Desiderata

- Meet people with a CAMPaM interest
- Finish our CAMPaM framework paper
- ...
- Implement an application in a CAMPaM tool
  - Hardware/software codesign?
  - Control system design?
- Explore the use of CAMPaM to address present issues with enterprise wide adoption of Model-Based Design
  - Maintain consistency between different phases in design
  - What is a (semi-)formal method?

