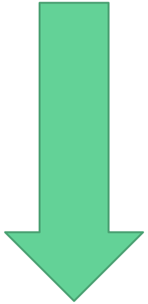
Domain-Specific Modelling of complex User Interfaces

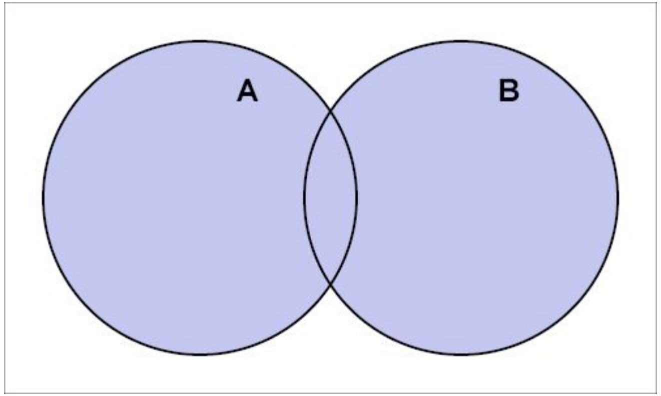
Corrado Ballabio
University of Antwerp - 16/12/16

Statecharts

- perfect for modelling timed discrete-event systems
- not suitable for complex user interfaces*



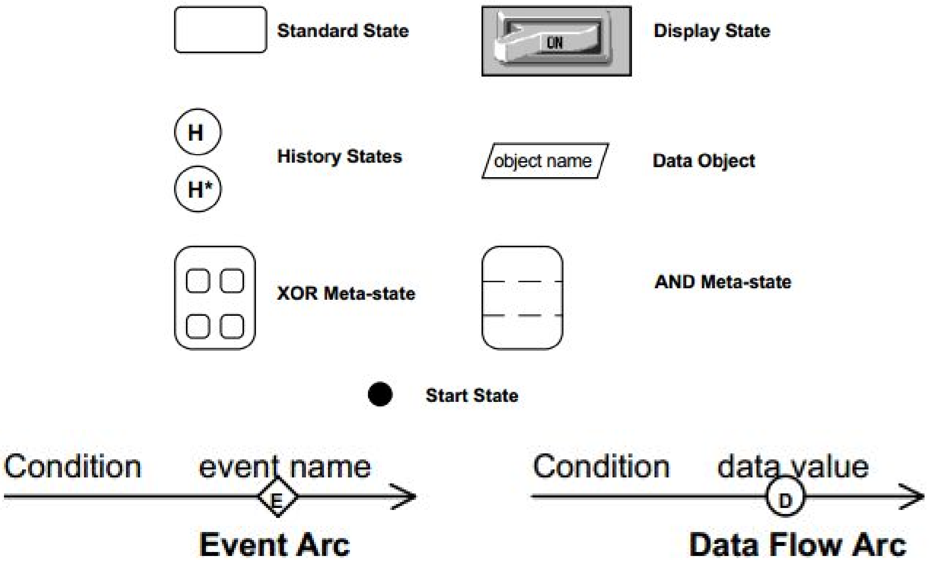
creation of extended formalisms



*:Hans Vangheluwe et al., SCCD: SCXML Extended with Class Diagrams

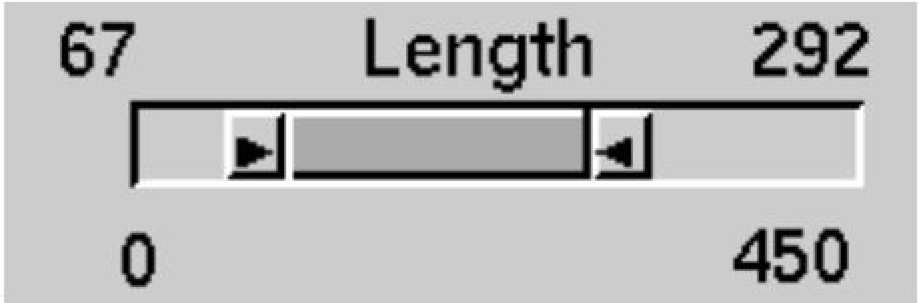
Interactive Object Graph*

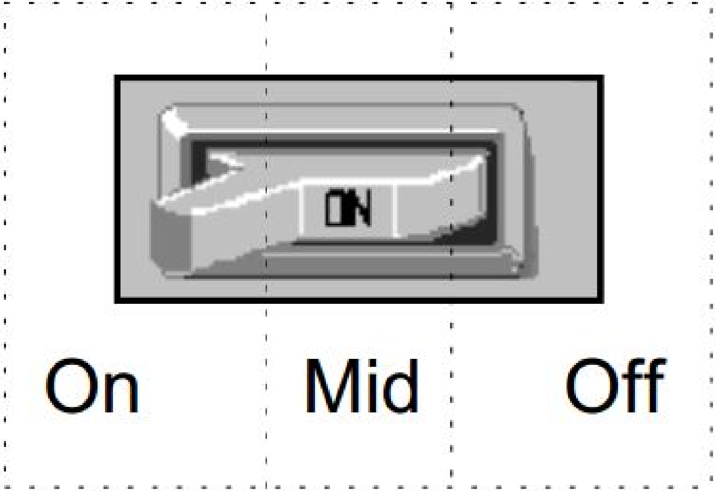
- designing of widgets user interface
- extends Statechart syntax with new nodes and arcs

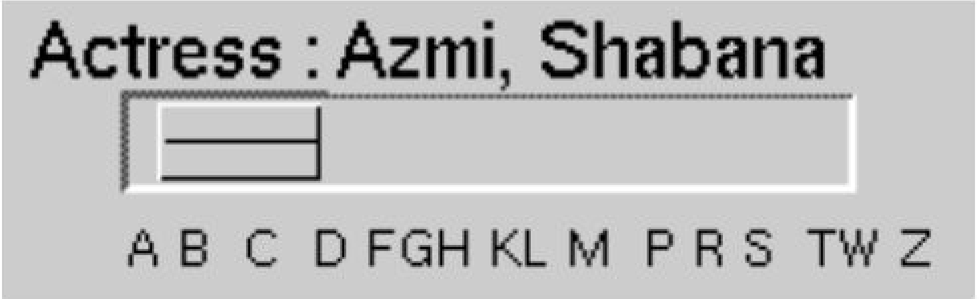


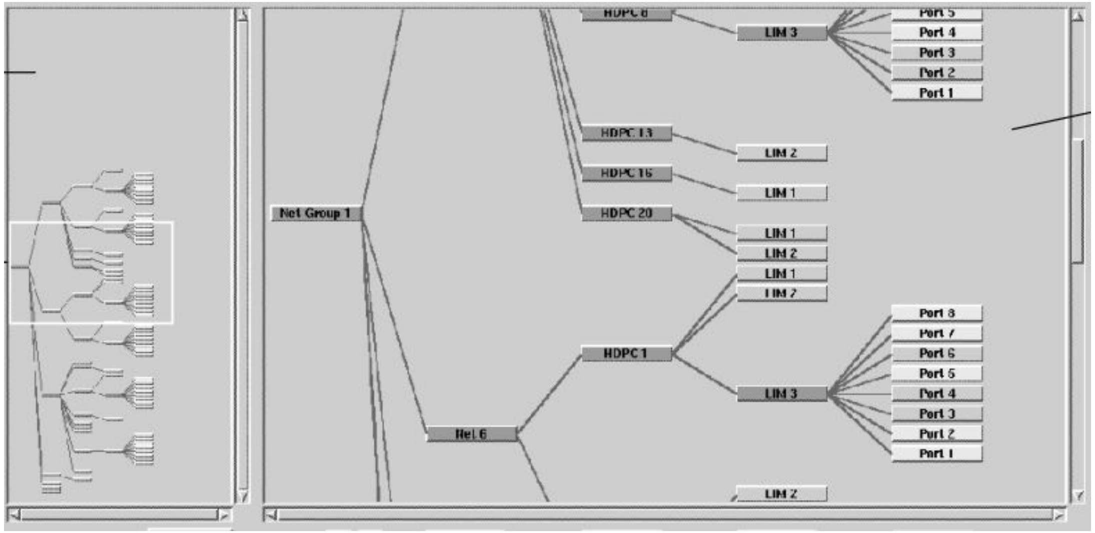
*:David Carr et al.,using interaction object graphs to specify graphical widgets, University of Maryland, 1994

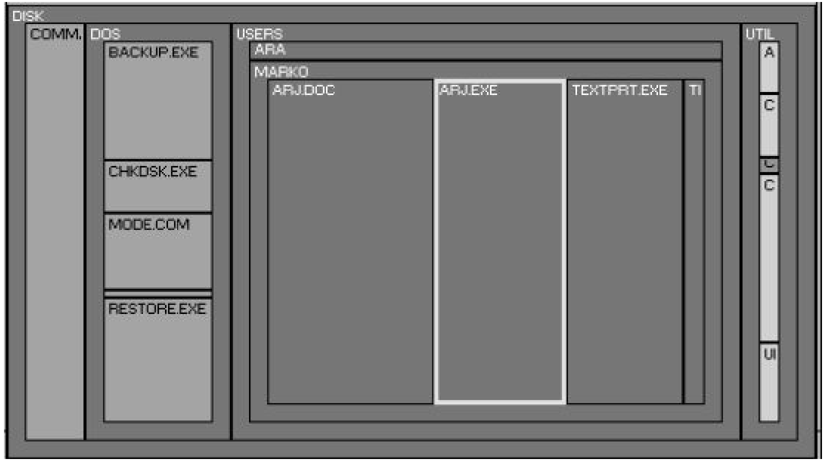
- and defines a new way for describing transitions:
  - **BNS**: booleans, numbers and strings
  - **points**: ordered pair of number
  - **region**: set of points
  - **icon**: region with a graphical representation
  - **view port:** region with a mapping function for underlying application data
  - **window**: groups all the objects in hierarchic levels
  - **user input:** M@, MΔ, ΔM, Mv, Mˆ, in[region], ~[region], [region]~


67
Length
292
0
450


ON
On
Mid
Off

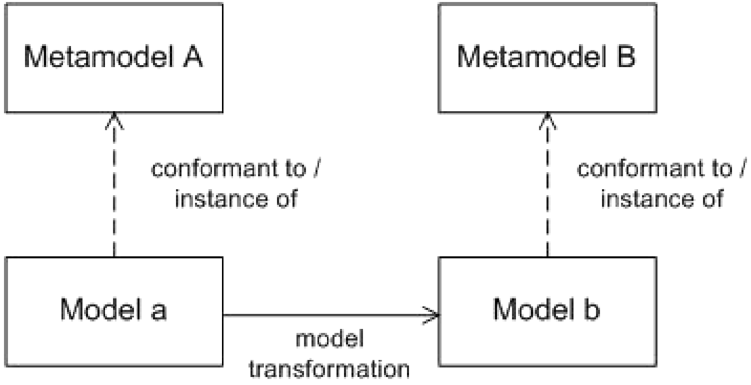

Actress : Azmi, Shabana
A B C D FGH KL M P R S TW Z


HDPC 8
LIM 3
Port 5
Port 4
Port 3
Port 2
Port 1
HDPC 13
LIM 2
HDPC 16
LIM 1
Net Group 1
HDPC 20
LIM 1
LIM 2
LIM 1
LIM 2
Port 8
Port 7
Port 6
Port 5
HDPC 1
LIM 3
Port 4
Port 3
Port 2
Port 1
Net 6
LIM 2


DISK
COMM.
DOS
BACKUP.EXE
CHKDSK.EXE
MODE.COM
RESTORE.EXE
USERS
ARA
MARKO
ARJ.DOC
ARJ.EXE
TEXTPRT.EXE
TI
UTIL
A
C
C
UI

lack of being able to prototype and directly test the specification

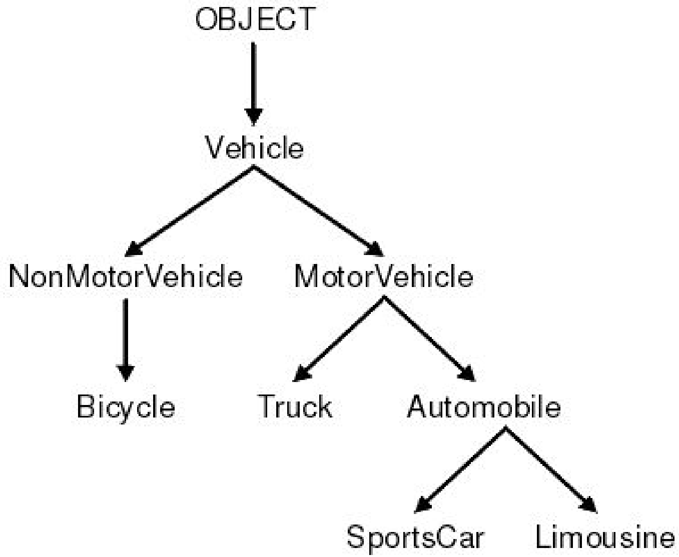
need for a model transformation that allows to draw the widgets and directly execute them



SCCD

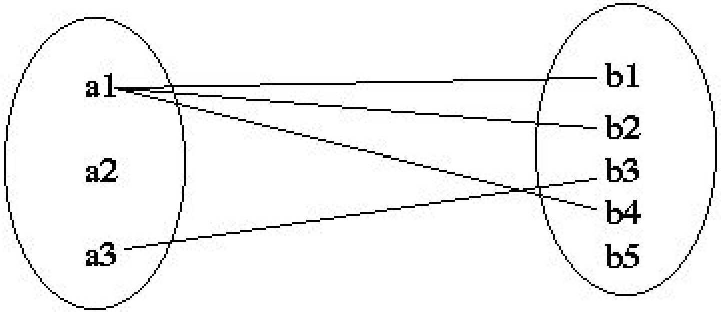
- combines Statechart and Class Diagram Formalisms
- fills the software complexity gap
- adds structural object-oriented expressiveness
- concrete syntax in SCCDXML

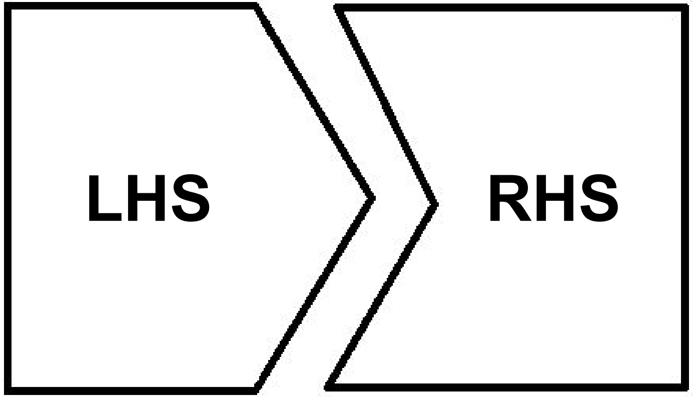
- System structure → Classes
- System behaviour → Statechart



Future Work

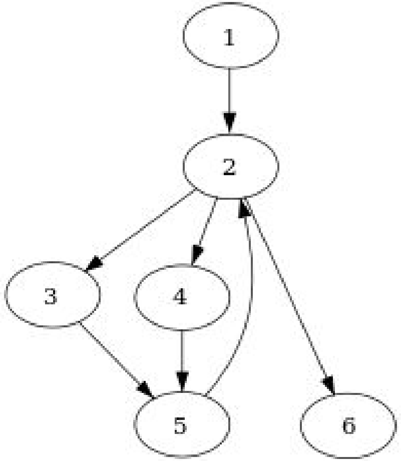
- mapping elements from both the formalisms





- transformation rules

- Scheduling of the rules



- code generation and widgets testing