

# 41. Meta-CASE-Werkzeuge: MetaEdit+ von MetaCase

1

Prof. Dr. Uwe Aßmann  
Technische Universität Dresden  
Institut für Software- und  
Multimediatechnik  
<http://st.inf.tu-dresden.de>  
Version 13-1.1, 09.01.14

- 1) Meta-CASE-Werkzeuge
- 2) MetaEdit+
- 3) Introduction to Fujaba

Softwareentwicklungswerkzeuge (SEW) © Prof. Uwe Aßmann

## Obligatory Reading

- ▶ MetaCase. Domain-Specific Modeling With Metaedit+: 10 Times Faster Than UML. White paper. [http://www.metacase.com/papers/Domain-specific\\_modeling\\_10X\\_faster\\_than\\_UML.pdf](http://www.metacase.com/papers/Domain-specific_modeling_10X_faster_than_UML.pdf)
- ▶ MetaCase. Abc To Metacase Technology. [http://www.metacase.com/papers/ABC\\_to\\_metaCASE.pdf](http://www.metacase.com/papers/ABC_to_metaCASE.pdf)
- ▶ A Comparison of ATL and Story-Driven Modeling (Fujaba-style GRS)
  - [http://www.es.tu-darmstadt.de/fileadmin/download/publications/spatzina/PP\\_AGTIVE\\_2011.pdf](http://www.es.tu-darmstadt.de/fileadmin/download/publications/spatzina/PP_AGTIVE_2011.pdf)

Prof. U. Aßmann, SEW 2

## Literatur

- ▶ [Nill] C. Nill. Analysis and Design Modeling Using Metaphorical Modeling Entities. A Modeling Language for the Tools and Materials Approach. Diplomarbeit Technische Universität Dresden, 2006.
- ▶ <http://www.metacase.com/support/45/manuals/index.html>

## 41.1 Meta-CASE-Werkzeuge

4

Softwareentwicklungswerkzeuge (SEW) © Prof. Uwe Aßmann

Prof. U. Aßmann, SEW 3

## Nutzung von Meta-CASE

- ▶ Ein **Meta-CASE-Werkzeug** ist eine metamodelldgesteuerte Entwicklungsumgebung für den Entwurf von SEU und Softwarewerkzeugen
  - Metamodellsteuerung zur Herstellung einer individuell angepassten Werkzeug-Umgebung:
    - Generierung von Repositorien mit Frontend- und Backend-Tools für Austauschformate
    - Generierung von Editoren und Kompositionswerkzeugen für Artefakte
    - Kompositionssysteme zur Komposition von Werkzeugen
  - Modellierung von textuellen und graphischen Sprachen
  - Modellierung von domänenspezifischen Sprachen und ihren Werkzeugen (domain-specific languages, DSL)

## Productivity by Meta-CASE

- ▶ Meta-CASE improve the productivity
  - of a software development team
  - of a team of domain engineers
  - Domain-specific methods are 5 to 10 times faster than using (UML-)notation
  - Reference: Domain-Specific Modeling: 10 Times Faster Than UML; Whitepaper MetaCase 2005; <http://www.metacase.com/de/>
- ▶ Meta-CASE are the most productive tools we know for the construction
  - of DSL
  - of tools
  - of composition systems
  - of IDE (SEU)
- ▶ You take part in a course which presents the most productive tools we know!



## Weitere Beispiele zu Meta-CASE

- ▶ MetaEdit+ (commercial): Parametrisierbares CASE-Tool mit
  - Editor für rollenorientierte Metamodelle (MetaEdit+ rollenorientierte Metasprache)
  - Generator für die Erstellung der Methodenbeschreibung
  - Gute Anbindung an GUIs with Screen-Flow-Language
- ▶ AdoXX (commercial), BOC Vienna
- ▶ KOGGE, JKOGGE: Generator für grafische Entwurfsumgebungen
  - KOGGE basiert auf einer formalen Meta-Tool-Beschreibung und einem Interpreter (Prof. Ebert, Uni Koblenz)
    - <http://www.uni-koblenz-landau.de/koblenz/fb4/institute/IST/AGEbert/MainResearch>
- ▶ Eclipse Modeling Facility (EMOF):
  - Benutzt eine Teilmenge von MOF
- ▶ OpenArchitectureWare (EMOF): Moved to Eclipse
  - <http://www.openarchitectureware.org/>
- ▶ Netbeans: IDE based on MOF
- ▶ MOFLON: IDE based on MOF, with Storyboards (GRS), Logic (OCL) and TGG (GRS)
- ▶ Fujaba: with Storyboards (GRS)



## 41.2 MetaEdit+ von MetaCase

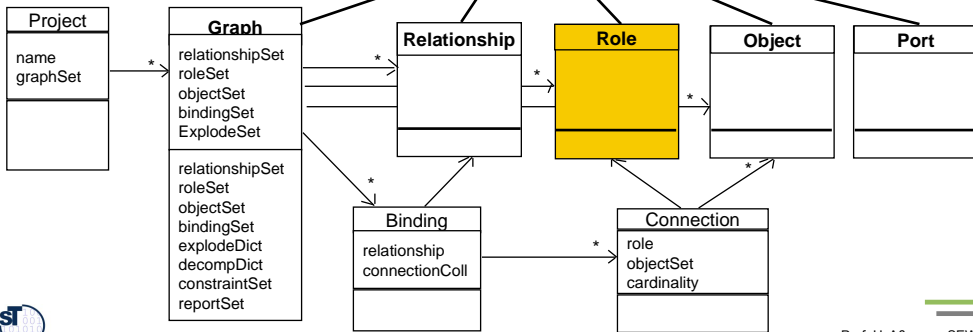
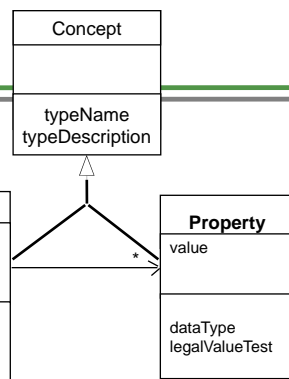
- <http://www.metacase.com/download/> Evaluation version
- [http://www.metacase.com/cases/dsm\\_examples.html](http://www.metacase.com/cases/dsm_examples.html) Many more DSL examples
- <http://www.metacase.com/resources.html> Articles and handbooks

# Wdh: Metasprache von MetaEdit+

Unterstützt Graphen und Rollen mit GOPRR

Metamodell:

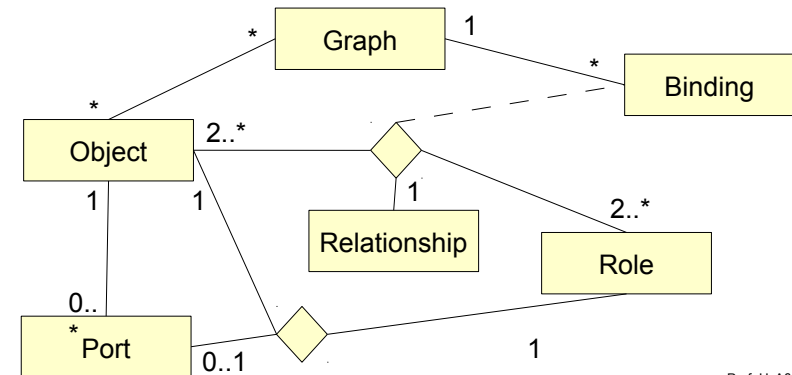
- Graph Tool
- Object Tool
- Property Tool
- Relationship Tool
- Role Tool



# Wdh: Graph Types in MetaEdit+

A graph type (diagram) defines:

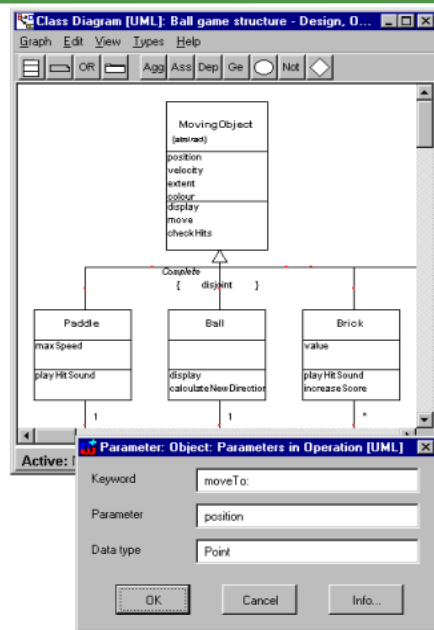
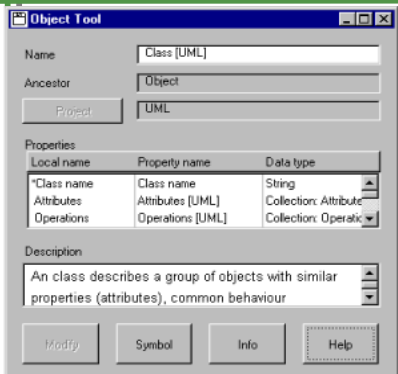
- Objects
- Roles
- Relationships
- Allowed Bindings between all entities:
  - a binding consists of a relationship with roles and playing objects



# Erstellen eines eigenen CASE-Tools mit MetaEdit+

Entwurf der eigenen Methode

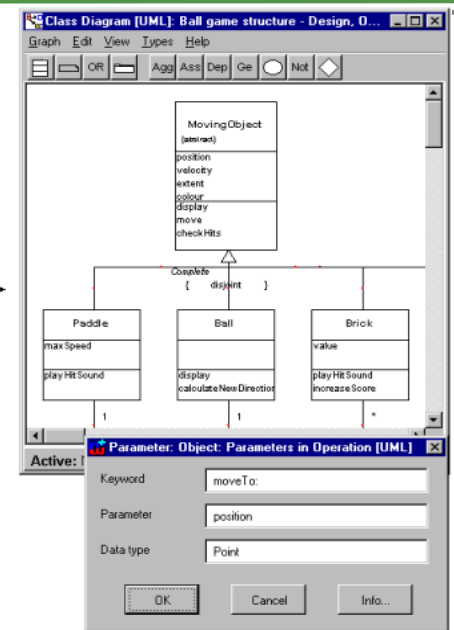
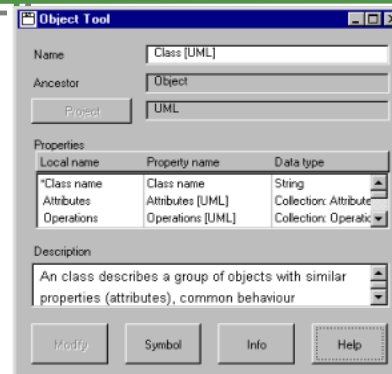
Benutzen der eigenen Methode



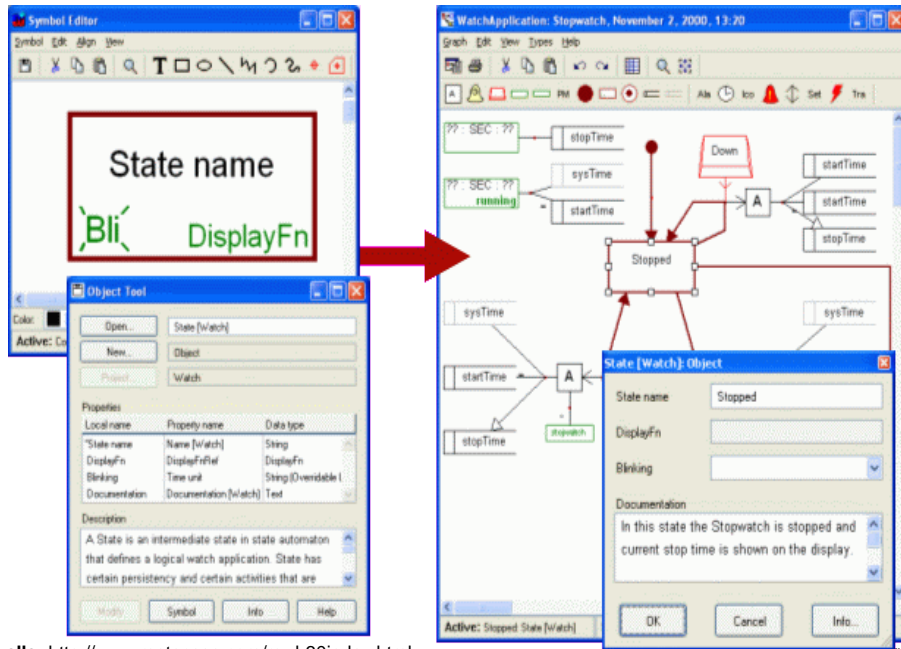
# Erstellen eines eigenen CASE-Tools mit MetaEdit+

Entwurf der eigenen Methode

Benutzen der eigenen Methode



## MetaEdit+ Workbench für ein State Diagram (STD)



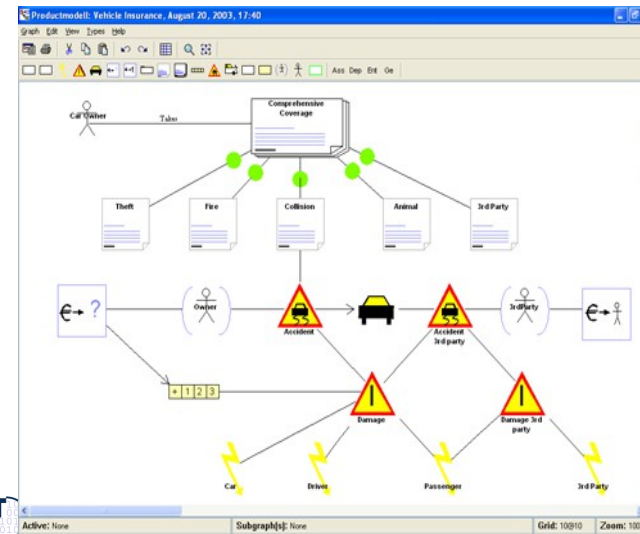
Quelle: <http://www.metacase.com/mwb30index.html>

Prof. U. Alsmann, SEW

1

## Insurance DSL

- For modeling of insurance products
- Generators produce the required insurance data and code for a J2EE website

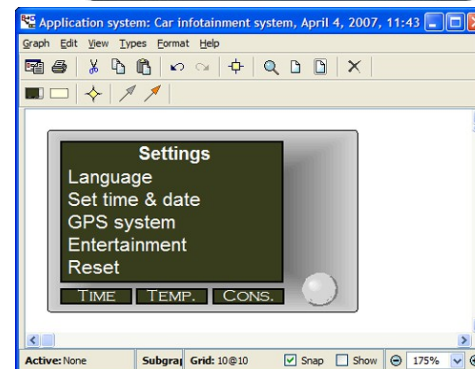
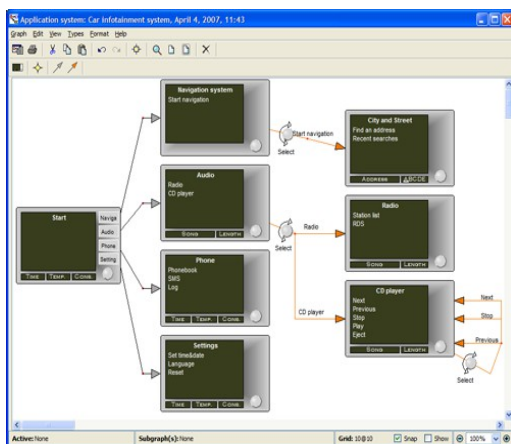


Prof. U. Alsmann, SEW

1

## Automotive Entertainment DSL

- Domain: car infotainment system and user interface elements
- Design of the logic and flow via connecting the modeling concepts between GUI and application concept metamodel editor



<http://www.metacase.com/cases/autoinf>

## Werkzeuge in MetaEdit+

- Report Generator:
  - Skriptgesteuert, zur Erzeugung von Texten und Code
- API (API-Server):
  - MetaEdit+ ist in Smalltalk implementiert
  - Zugreifbar über Web Server (SOAP mit WSDL)

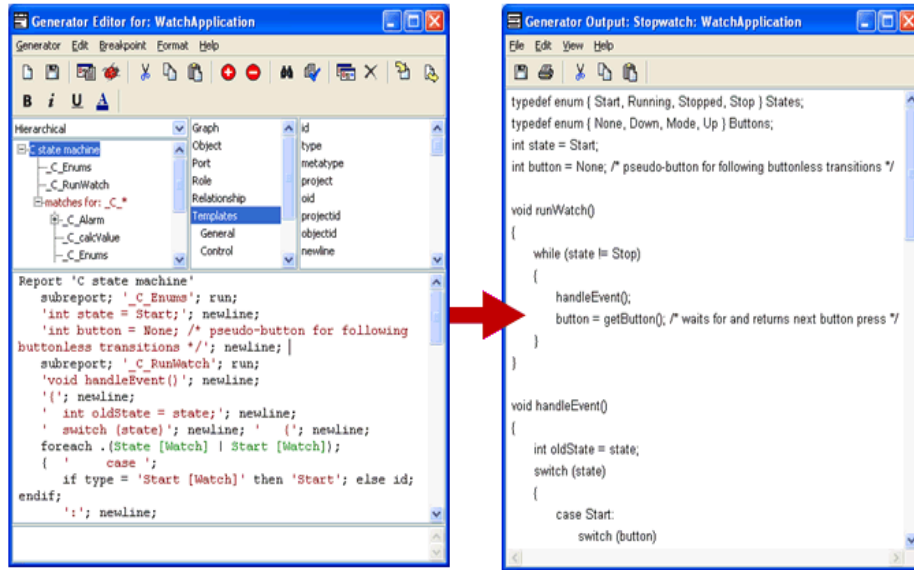
```
Report 'ExportToolUIModel'
'<?xml version="1.0" encoding="UTF-8"?>'newline;
'<model>'newline;
foreach .Graph {
do :Graph {
if type; = 'Tools UIs Model' then
subreport; 'ToolUI_XML' run;
else
subreport; 'structureXML' run;
endif
}
}
'</model>'newline;
endreport
```

[Null]

Prof. U. Alsmann, SEW

1

## Editor for Scripts for Code Generation

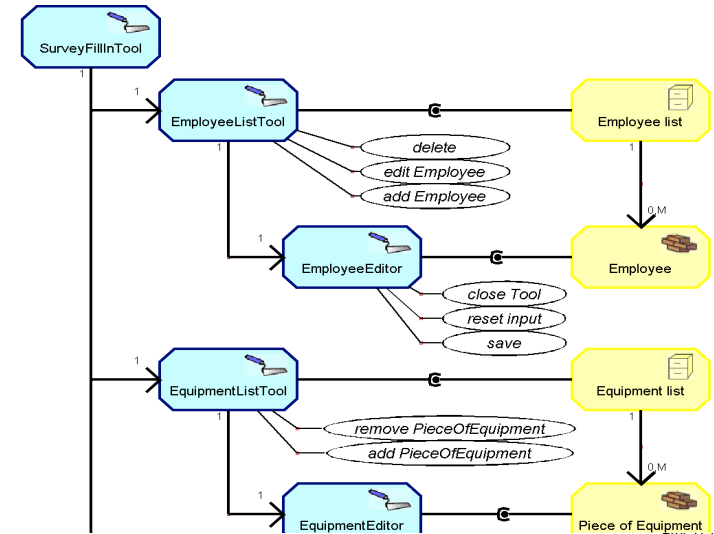


Prof. U. Aßmann, SEW

1

## Tool/Material DSL, Modeled in MetaEdit+

- ▶ [Nil] presented a DSL for Tools and Materials (TAM-DSL), modelled in in GOPRR with MetaEdit+
- ▶ Editor represents Tools and Materials graphically



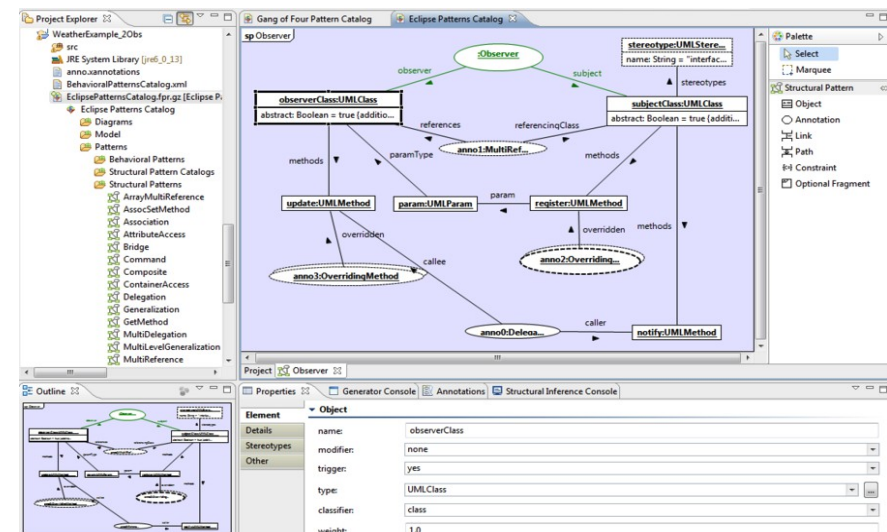
Prof. U. Aßmann, SEW

1

## 41.2 Introduction to Fujaba

www.fujaba.de

- ▶ Fujaba is a MetaCASE-tool based on GRS
- ▶ Basic technology: graph pattern matching and rewriting



<http://www.fujaba.de/typo3temp/pics/604c5c6c9e.png>

Prof. U. Aßmann, SEW

2



The End

