The D4 Platform

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MCDA Software Challenges

- Today's mainstream web technologies
  - JEE: Java, JSP, HTML/JS, RIA, Spring, JPA, SQL, DMBS …
    are robust but the implementation is difficult, slow and expensive
- Decision Deck community deserves more
  - Implementing, experimenting and evolving new MCDA methods should be easy, fast and cheap
- D4 value proposition
  - An abstraction layer to JEE robust web technologies
  - An interactive designer to **build** and **evolve** MCDA methods

Agenda

I. D4 Overview
   - Key mechanisms to **build** and **evolve** MCDA methods

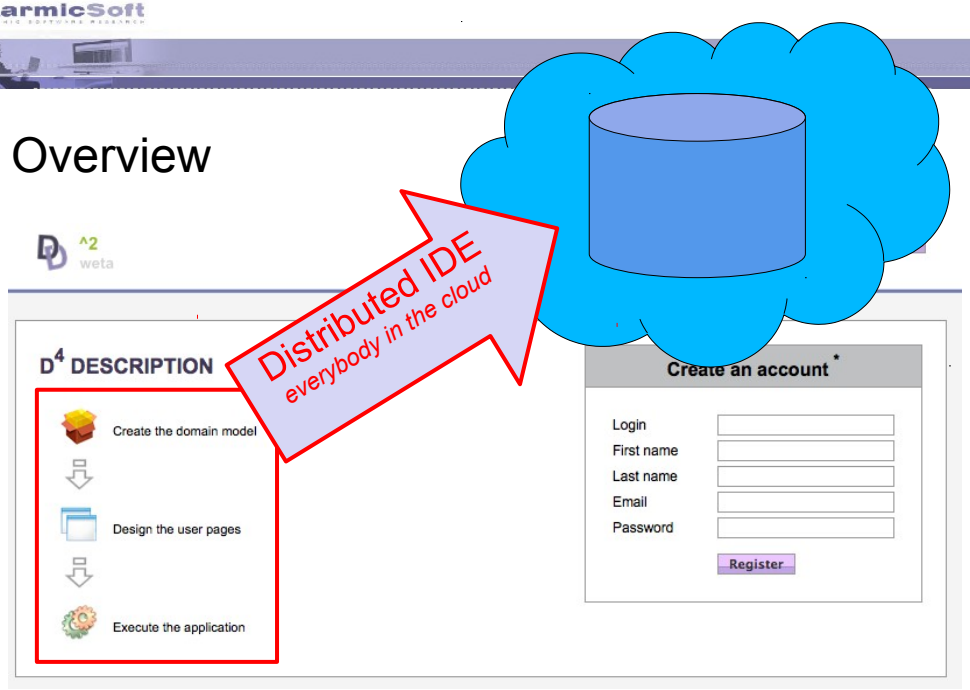
I. EBPA example
   - Step by step illustration : EBPA 2004

I. Conclusion
   - Progression and feedback

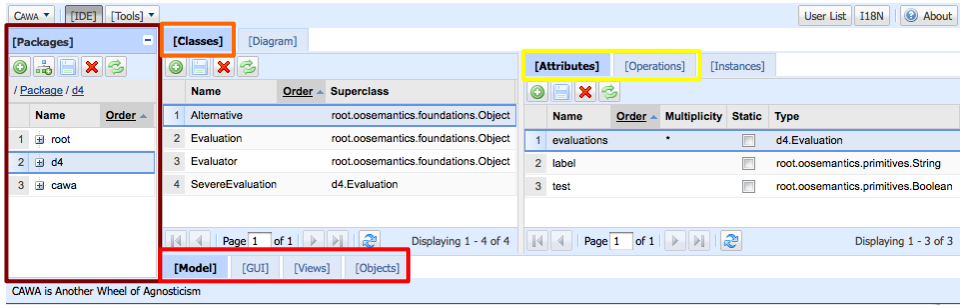
D4 = Distributed Designer for Decision Deck

- Distributed platform
  - Browser only, RIA IDE, hosted @uni.lu
- Design (build and evolve) MCDA applications
  - OO concepts : classes, attributes, operations (py)
  - RIA GUI : component (grids, forms, graphs …)
- Manage MCDA data
  - Persistent shared objects
- Made for MCDA researchers, experts
  - no dev skills required

Overview



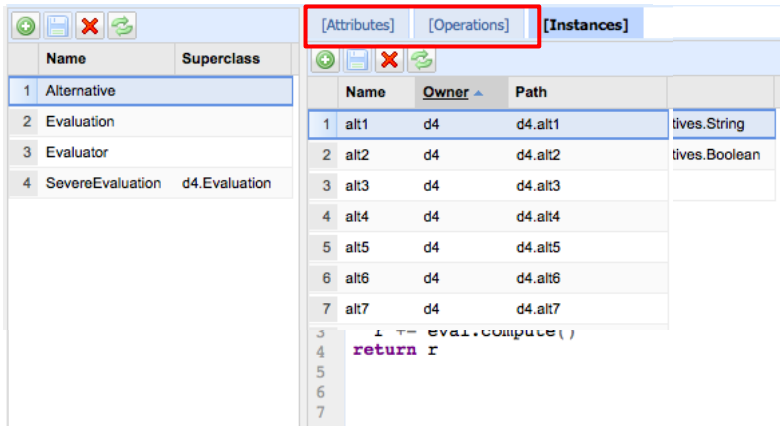
Packages, themes & typed components, with properties



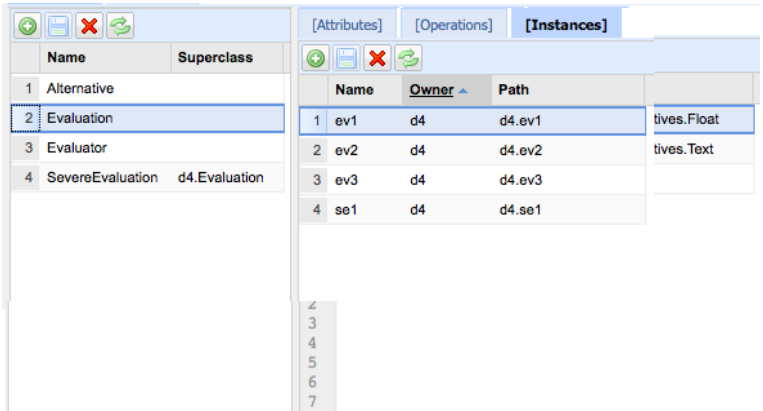
- Package oriented repository
- Theme oriented designer : design domain & user pages, then run application
- Typed component and property editors

Design alternatives

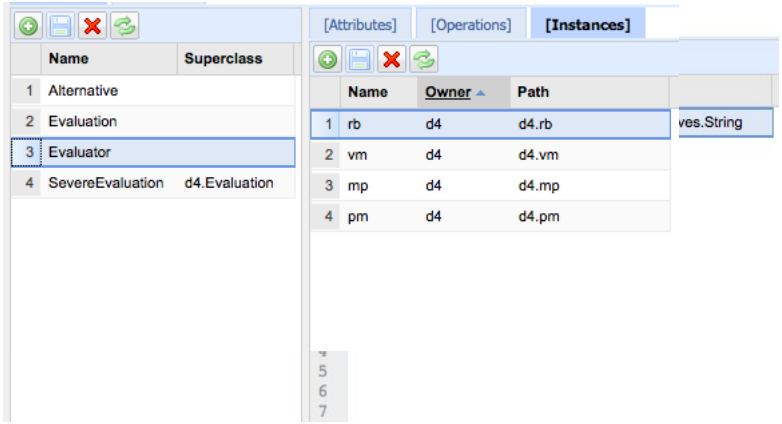
Encapsulation



Design evaluations



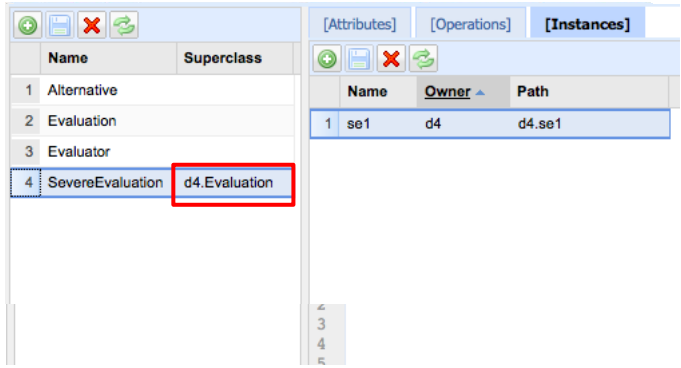
Design evaluators



Design severe evaluations

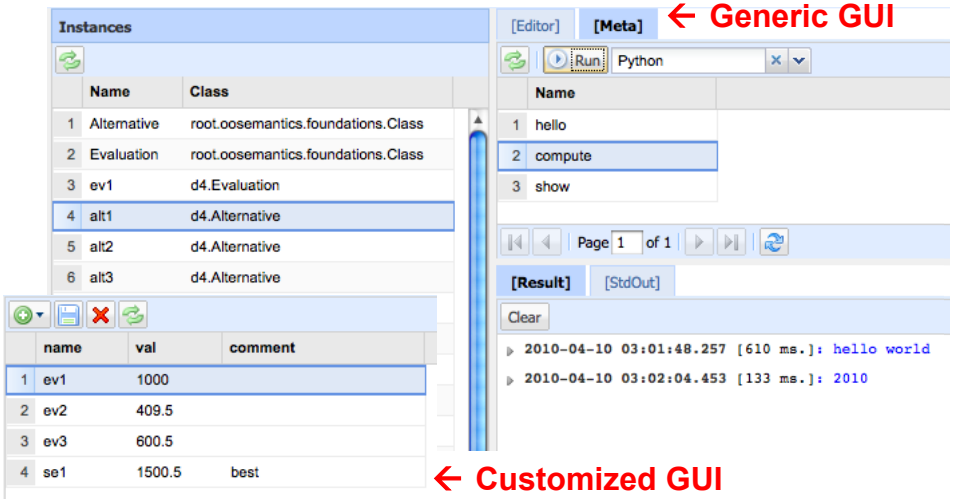
Polymorphism

Inheritance



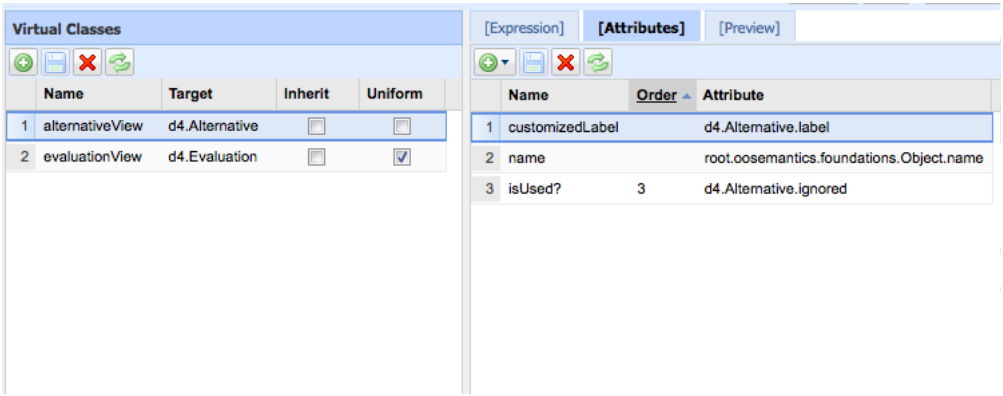
Live objects

← Generic GUI

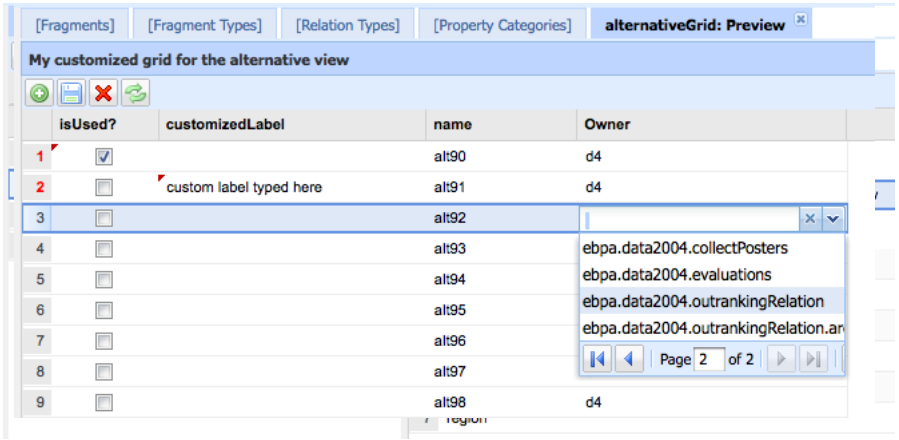


← Customized GUI

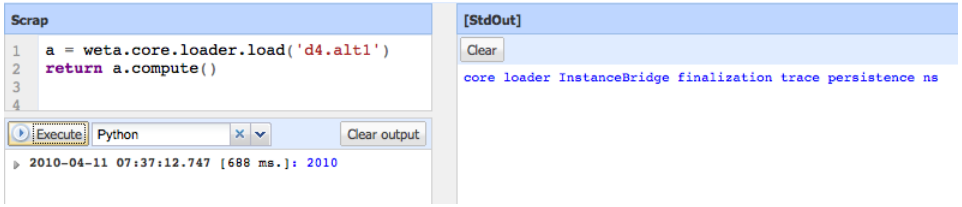
Views : virtual classes



GUI components



Scripting API, available in console



Monitoring the shared ressources

[Hibernate] [Memory]

com.karmicsoft.weta.model.Atom.instances	0	0	0	6
com.karmicsoft.weta.model.Atom.references	0	0	0	6
com.karmicsoft.weta.model.auth.User.roles	0	0	0	0

2nd level cache statistics

Regionname	Puts	Hits	Misses	Elements in memory	Size in memory (bytes)
com.karmicsoft.mydraft.webapp.model.i18n.I18NKey	0	0	0	0	0
com.karmicsoft.mydraft.webapp.model.i18n.I18NLang	0	0	0	0	0
com.karmicsoft.mydraft.webapp.model.i18n.I18NProperty	0	0	0	0	0
com.karmicsoft.weta.model.Atom	30790	36035	925	3203	4823112
com.karmicsoft.weta.model.Atom.components	18627	7061	2133	1363	1571496
com.karmicsoft.weta.model.Atom.instances	0	0	0	6	6402
com.karmicsoft.weta.model.Atom.references	0	0	0	6	6408
org.hibernate.cache.StandardQueryCache	1348	1401	1348	177	410040
org.hibernate.cache.UpdateTimestampsCache	0	0	0	1	369
					6817827

Key mechanisms

- Data structure and behaviour
  - Classes, with attributes and operations (py)
  - Inheritance, virtual classes (views)
- Data presentation and evolution
  - Updatable GUI components : grids, …
- Build and evolve your MCDA prototype
  - using RIA designers : click, give names and choose values
  - in minutes, using a browser only and an internet connection

  ➔ **easy**, **fast** and **cheap**

II. EBPA Example

Illustration

EURO 2004 Best Poster Award

MCDA application concerning a best choice decision problem

Real decision aid case:
EURO XX Rhodes, July 2004

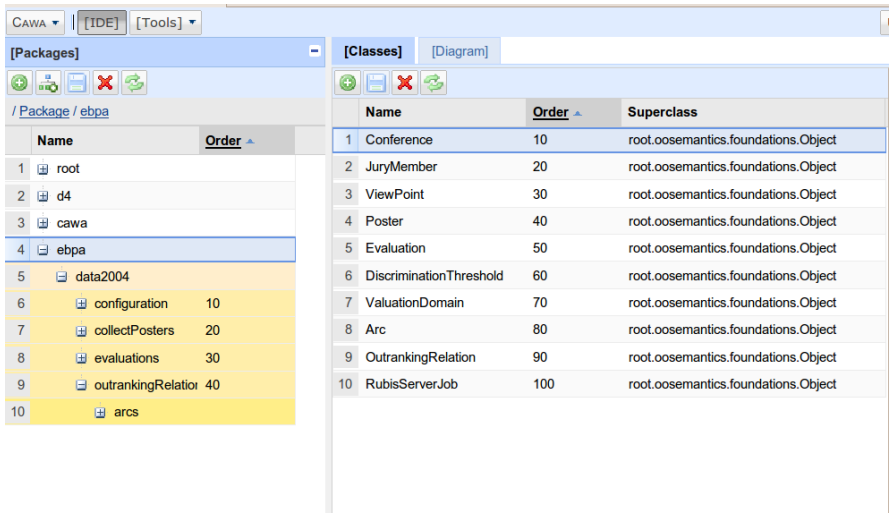
Size: 5 judges, 13 competing posters evaluated on 4 preference dimensions of ordinal significance

EURO 2004 Best Poster Award

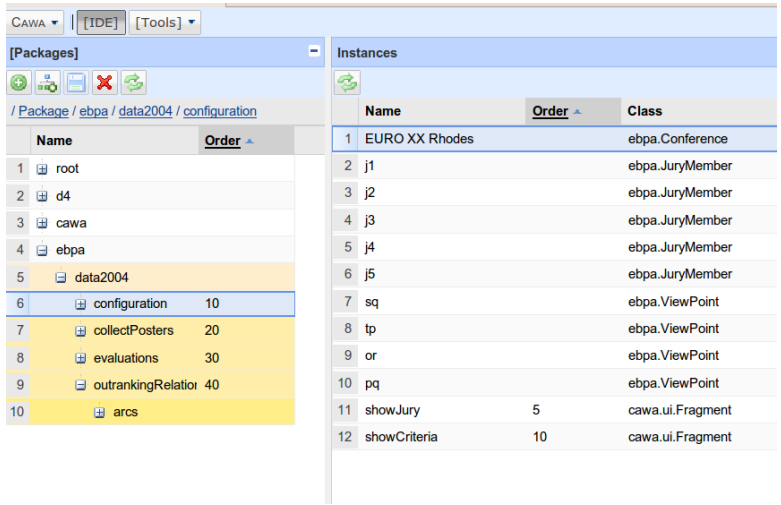
Decision making process:

- Configuration: choice of the jury and the preference dimensions
- Collecting the competing posters
- Evaluating the posters
- Modelling a pairwise “at least as good as” relation
- Construct a best choice recommendation via an Rubis Web Service under XMCDA-2.0.0
- Robustness analysis

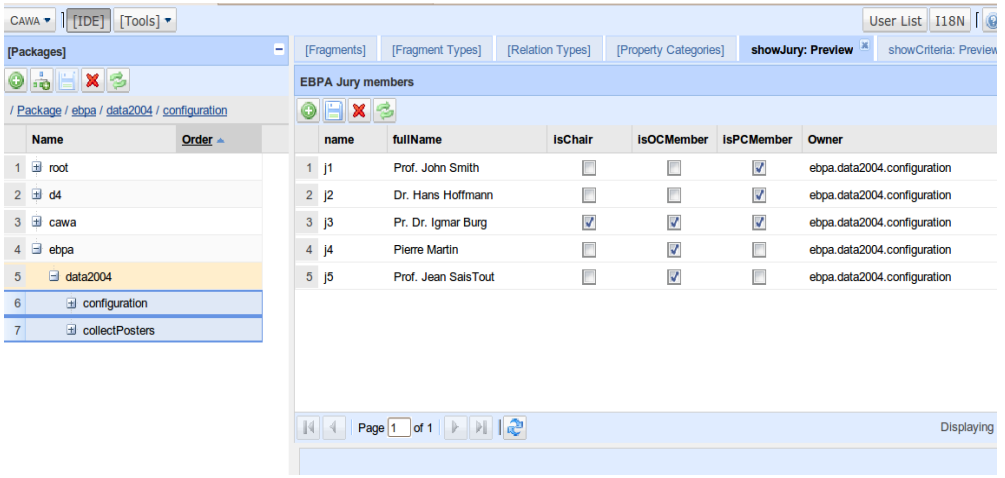
EBPA package and classes



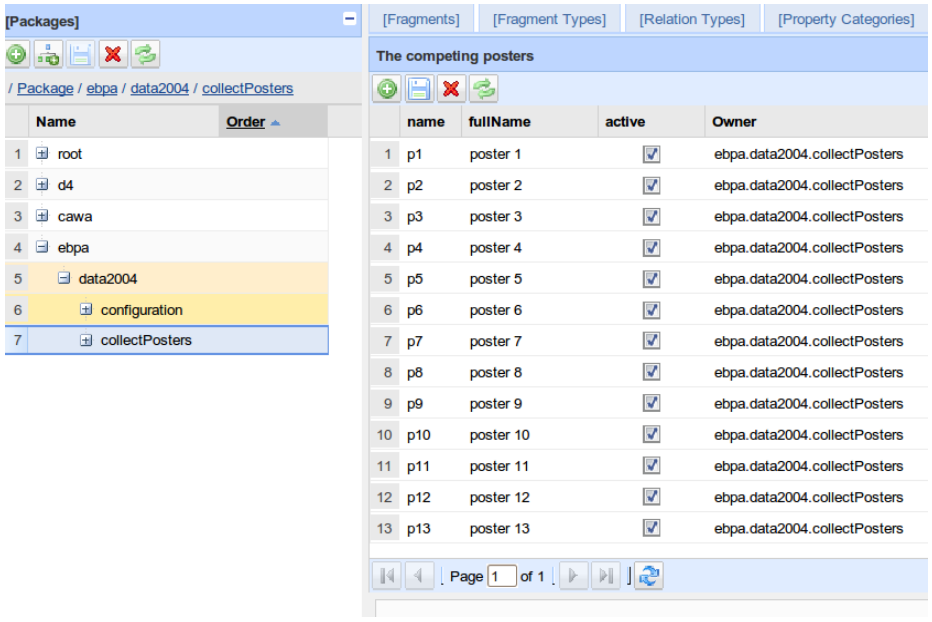
D4 snapshot: ebpa.configuration



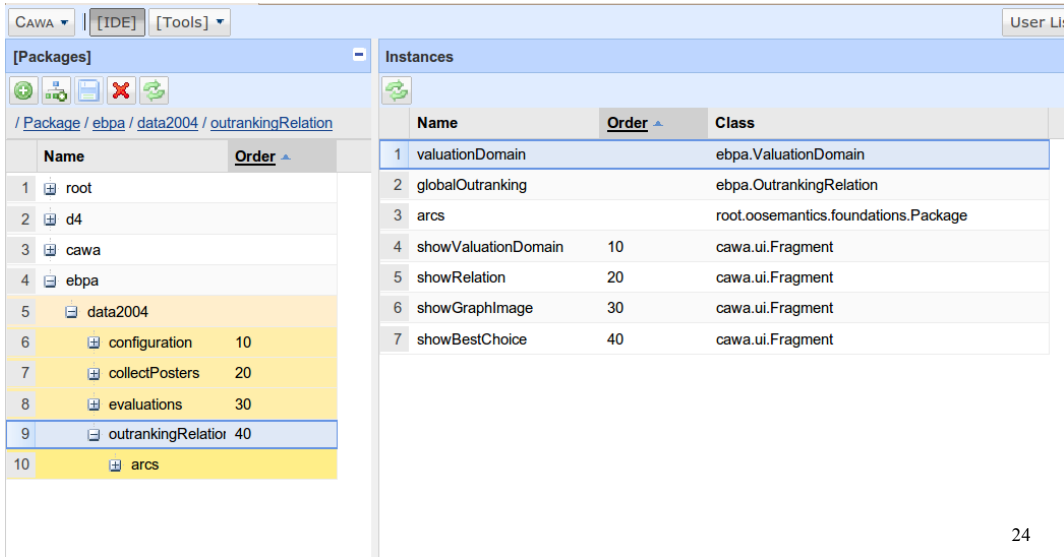
D4 snapshot: ebpa.showJury



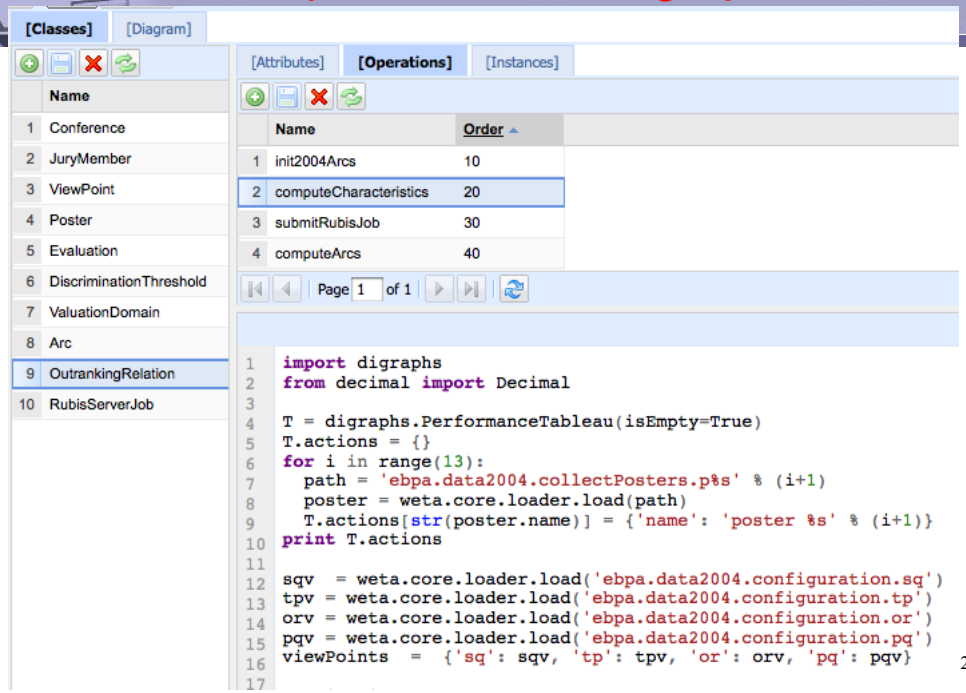
D4 snapshot: ebpa.collectPosters



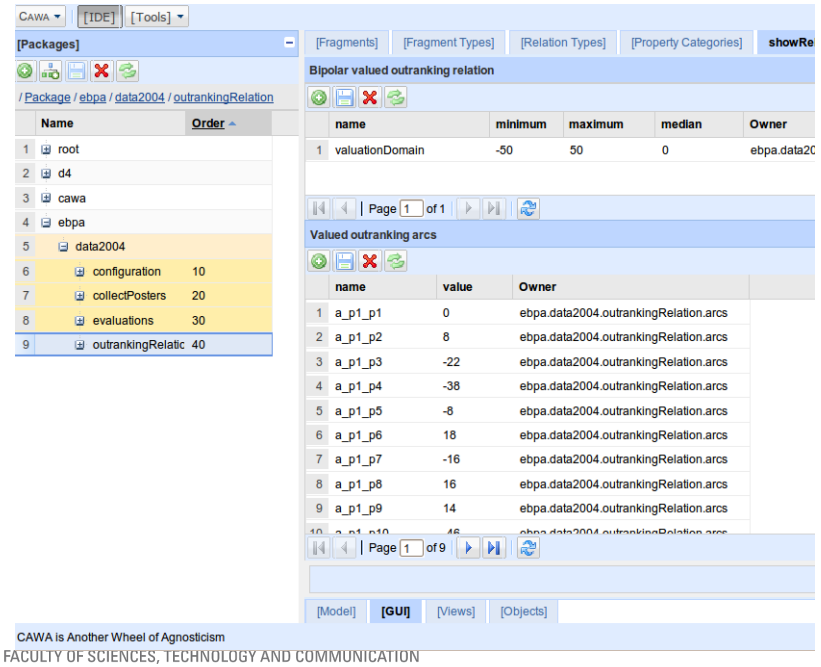
D4 snapshot: ebpa.outrankingRelation



D4 snapshot: Use of digraphs module



D4 snapshot: ebpa.showRelation



III. Conclusion

D4 Overview and EBPA example

- Progression
  - ☑ Reflective atomic persistency storage system
  - ☑ Molecular strong typed class management
  - % GUI components, more to come
  - % Advanced IDE, more to come : state machines designer
  - ☐ Community manager : fine-grained grant management, timemachine remote control
- Next decision deck workshop
  - D4 jump start : learn how to build and evolve your MCDA methods in minutes
  - Just bring your browser, no other skills required

Give man a application (d2) and
you'll feed him for a day

Give him a tool $(d2)^2$ and
teach him to design an application (d2)
then you'll feed him for a lifetime

KarmicSoft

Thanks

Q & A