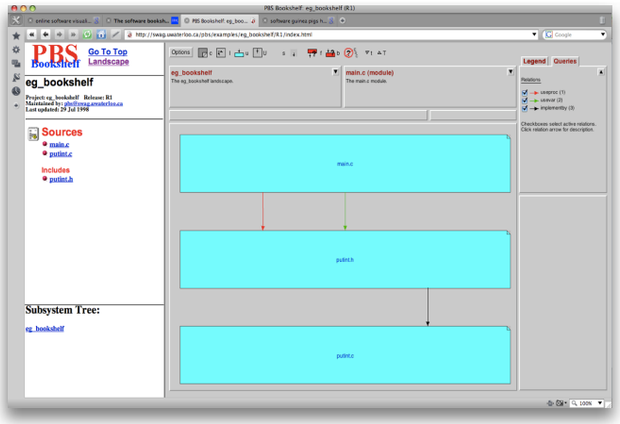
Web-based visualization tools for reverse engineering

Marco D'Ambros, Mircea Lungu
REVEAL @ University of Lugano
Switzerland

Reverse
Engineering
Timeline

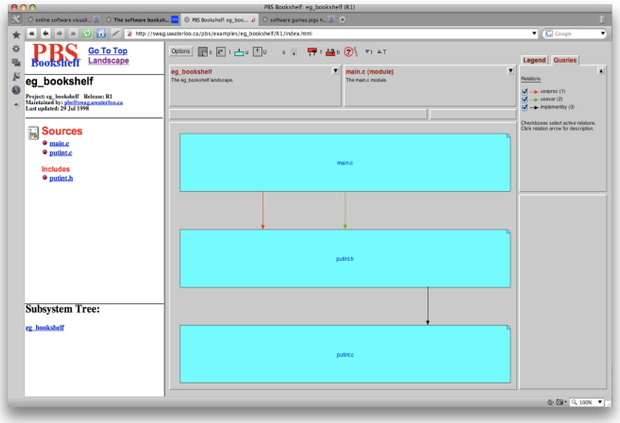
The Portable Bookshelf



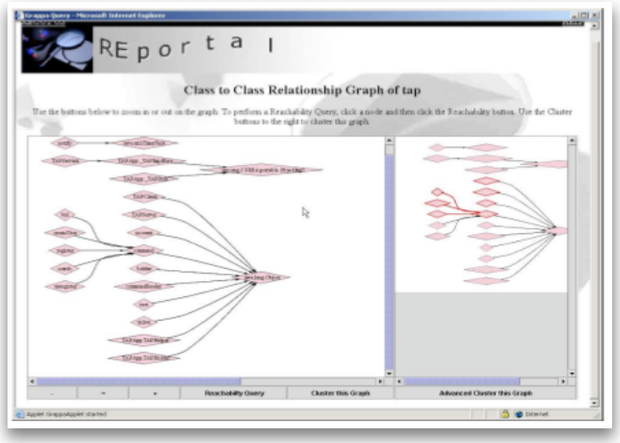
1998

Reverse Engineering Timeline

The Portable Bookshelf



REPortal

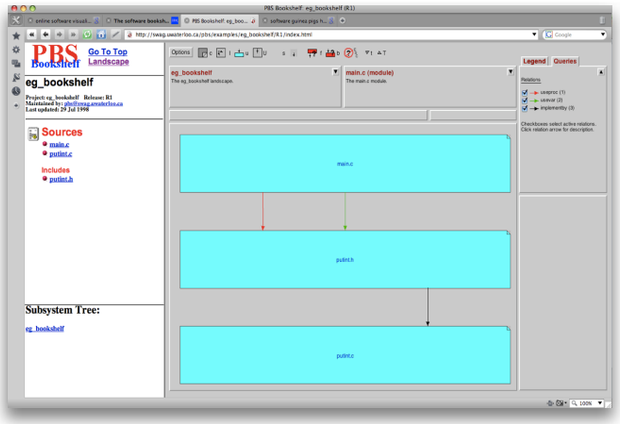


1998

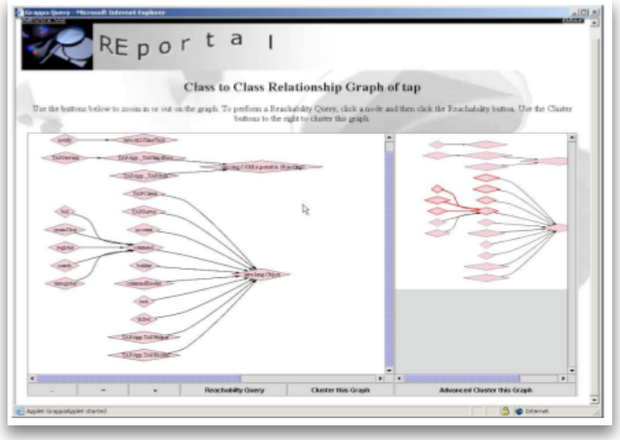
2001

Reverse Engineering Timeline

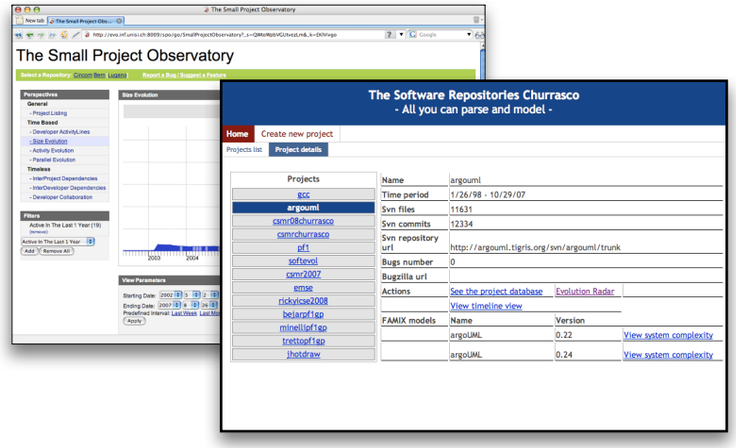
The Portable Bookshelf



REPortal



Small Project Observatory (SPO) & Churrasco



1998 2001 2007 2008

Reverse Engineering Timeline

Benefits of Web-based Reverse Engineering

Accessibility

Benefits of Web-based Reverse Engineering

Benefits of Web-based Reverse Engineering

Accessibility

Ease of Upgrade

Benefits of Web-based Reverse Engineering

Accessibility

Ease of Upgrade

Avoiding Duplicate Computation

Benefits of Web-based Reverse Engineering

Accessibility

Ease of Upgrade

Avoiding Duplicate Computation

Avoiding Duplicate Implementation

SPO
Churrasco

The Small Project Observatory

Software ecosystem analysis

Web-based interactive visualization

Goals

Software Ecosystem

A group of projects that are developed together in a certain organizational context.

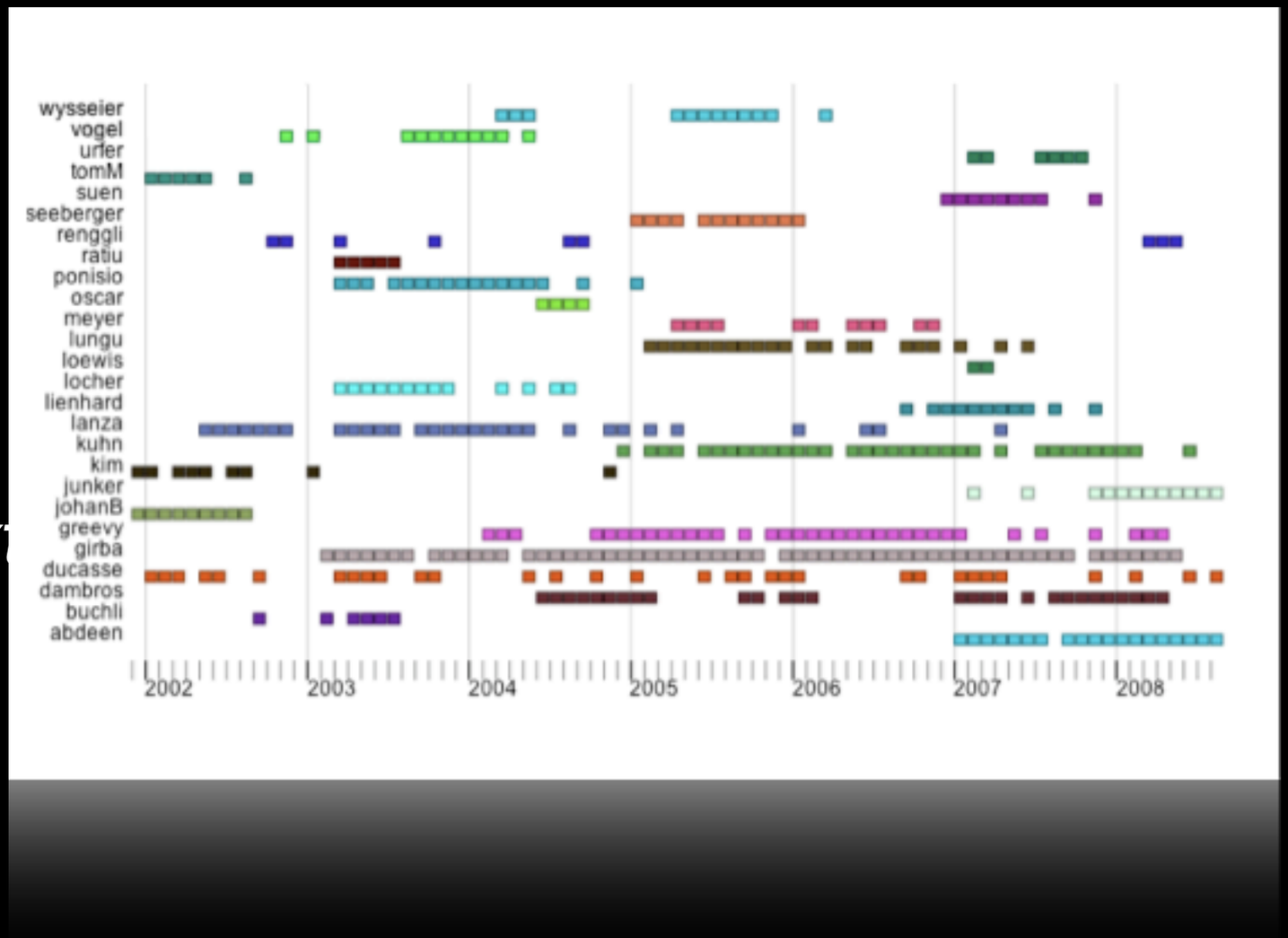
[Lungu et al. 07]

Software ecosystem analysis

Software Ecosystem

A group of projects that are developed together in a certain organizational context

[Lungu et al. 07]



Software ecosystem analysis

Software Ecosystem

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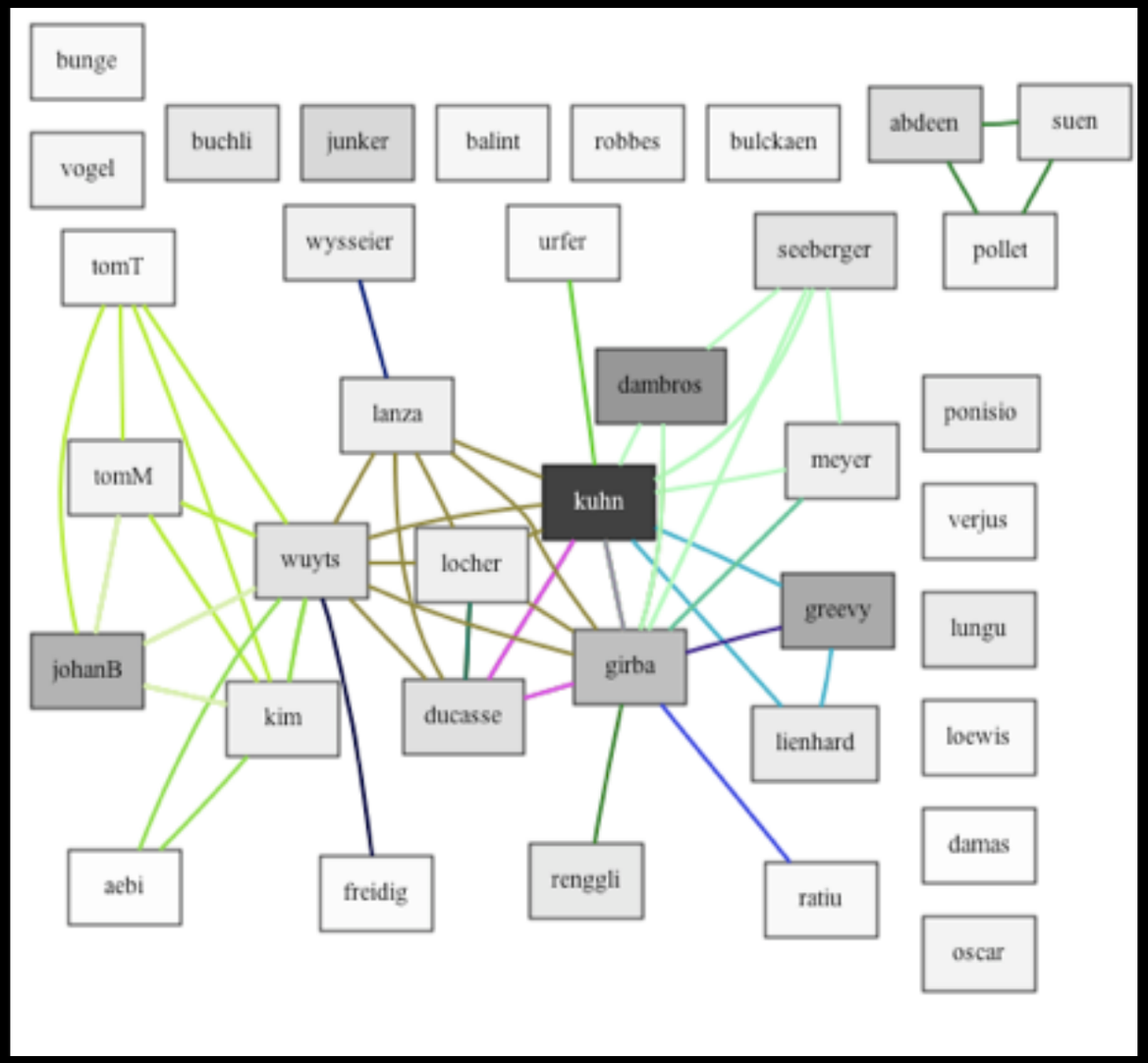
[Lungu et al. 07]

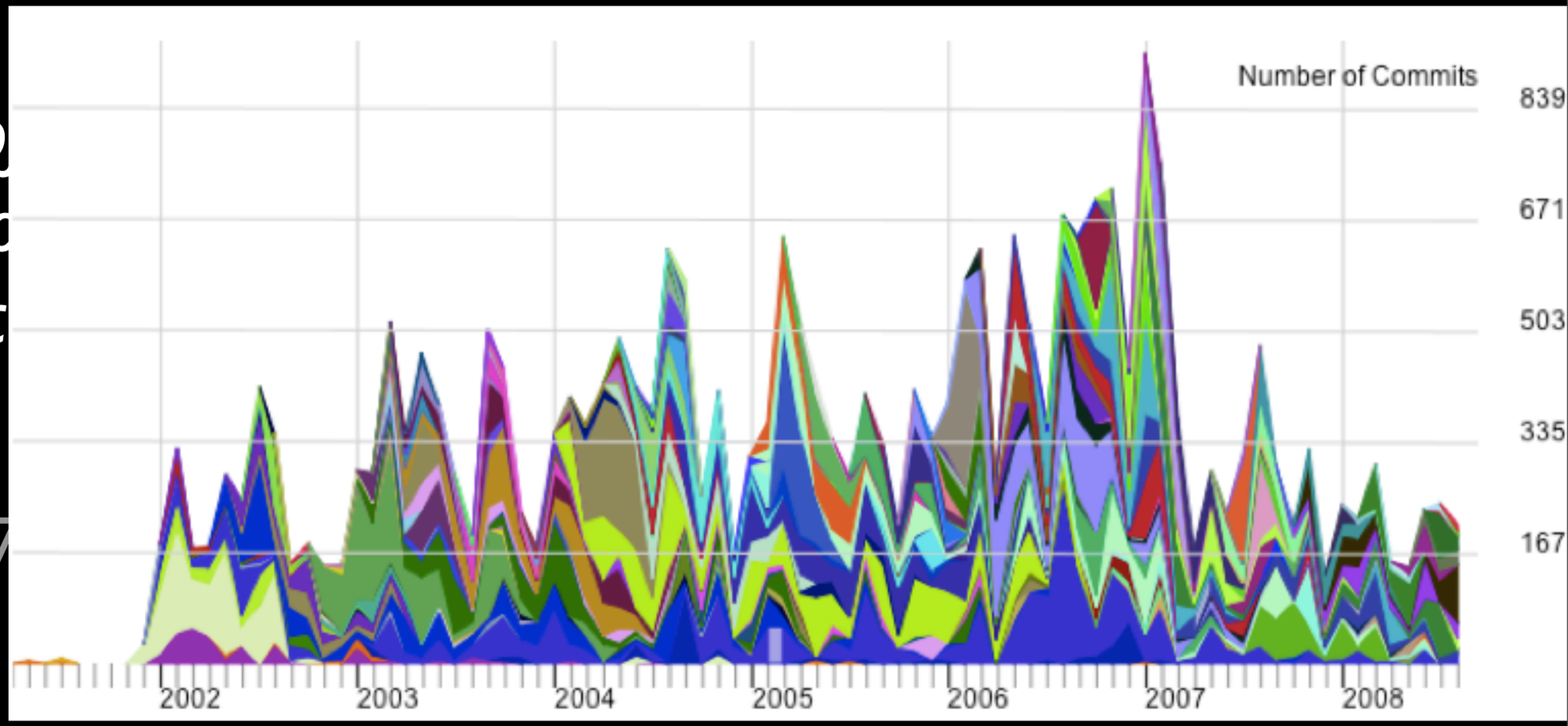


Software ecosystem analysis

Software Ecosystem

A group of proj
that are develo
together in a c
organizational

[Lungu et al. 07



Software ecosystem analysis

Software Ecosystem

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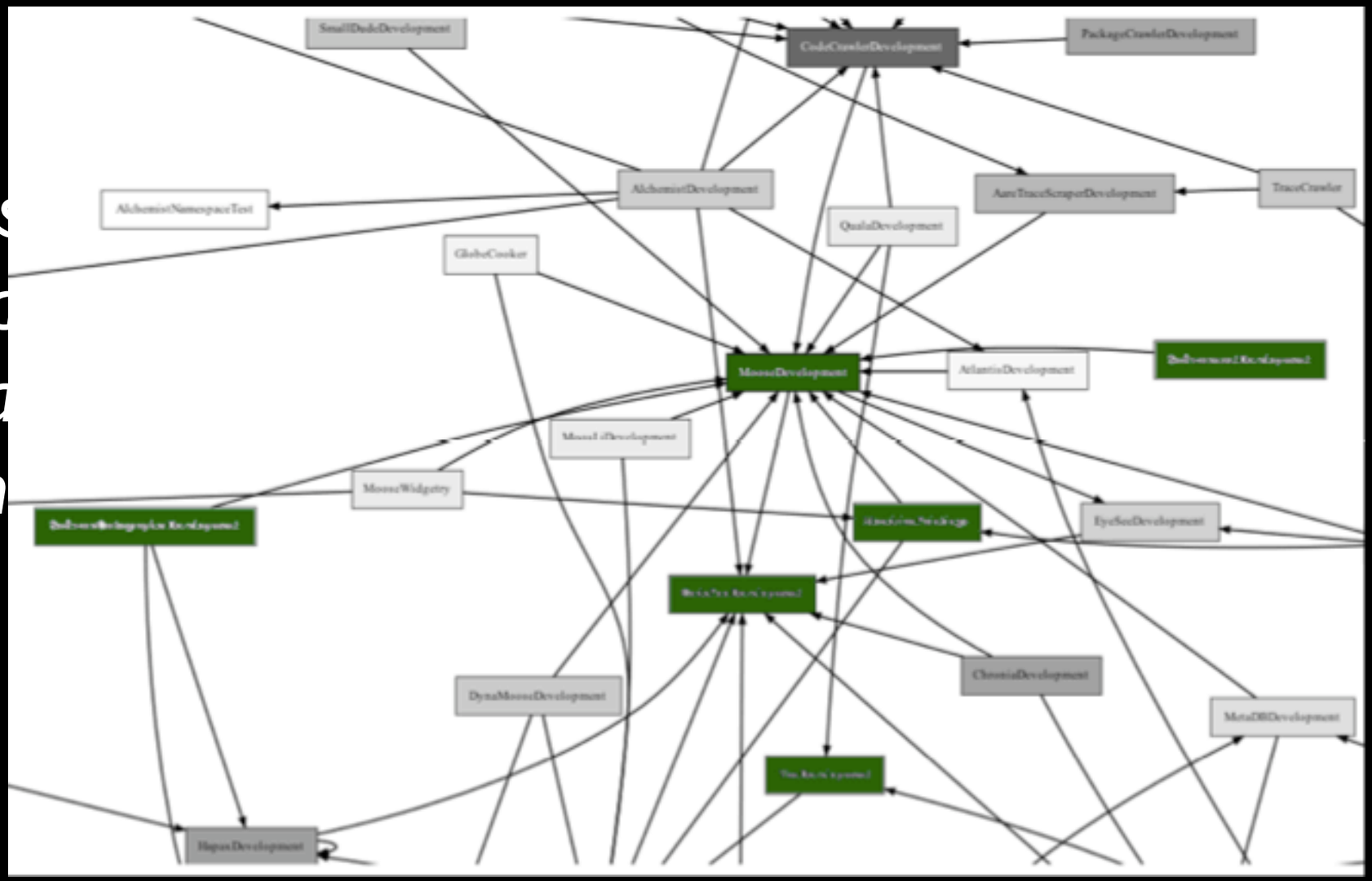
[Lungu et al. 07]



Interactive visualisation

Software ecosystem analysis

y
Metrics, Aggregation

z
Layout Engine, JS/SVG Generator

Web Development Framework

y

SVN

CVS

Projects, Developers, Histories

w

SVG Enabled

Interactive visualisation

Software ecosystem analysis

y
Metrics, Aggregation

z
Layout Engine, JS/SVG Generator

Web Development Framework

Projects, Developers, Histories

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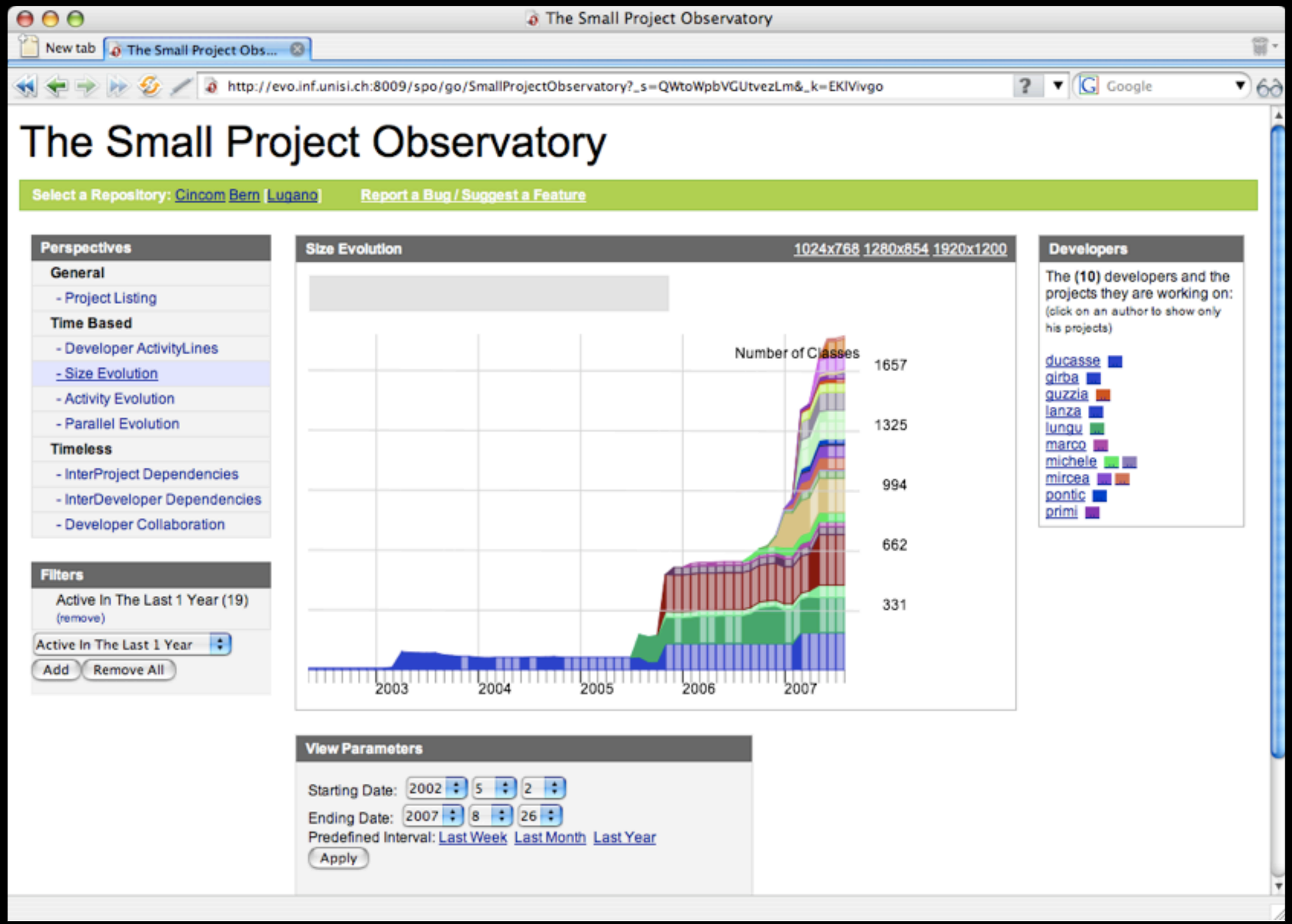
w

SVG Enabled



http://www.inf.unisi.ch/phd/lungu/**spo**

The Small Project Observatory

New tab | The Small Project Obs...

http://evo.inf.unisi.ch:8009/spo/go/SmallProjectObservatory?_s=QWtoWpbVGUtvezLm&_k=EKIVivgo

The Small Project Observatory

Select a Repository: Cincom Bern [Lugano] **Report a Bug / Suggest a Feature**

Perspectives

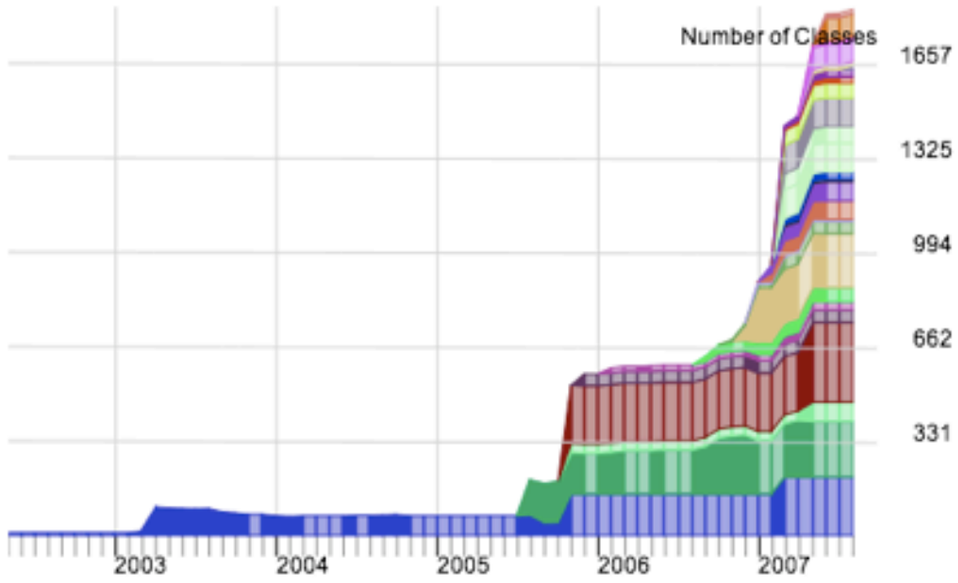
- **General**
  - Project Listing
- **Time Based**
  - Developer ActivityLines
  - Size Evolution
  - Activity Evolution
  - Parallel Evolution
- **Timeless**
  - InterProject Dependencies
  - InterDeveloper Dependencies
  - Developer Collaboration

Filters

Active In The Last 1 Year (19)
(remove)

Active In The Last 1 Year | Add | Remove All

Size Evolution 1024x768 1280x854 1920x1200



Developers

The **(10)** developers and the projects they are working on:
(click on an author to show only his projects)

ducasse
girba
guzzia
lanza
lungu
marco
michele
mircea
pontic
primi

View Parameters

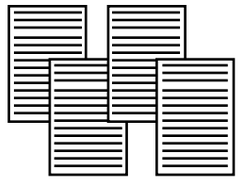
Starting Date: 2002 | 5 | 2
Ending Date: 2007 | 8 | 26
Predefined Interval: Last Week Last Month Last Year
Apply

http://www.inf.unisi.ch/phd/lungu/**spo**

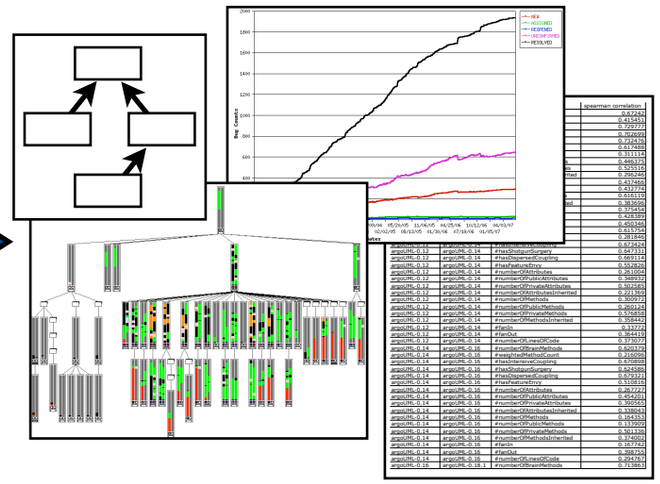
SPO
Churrasco

Churrasco

Goals



Modeling results



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argoUML-0.12	argoUML-0.14	#fanOut	0.729777
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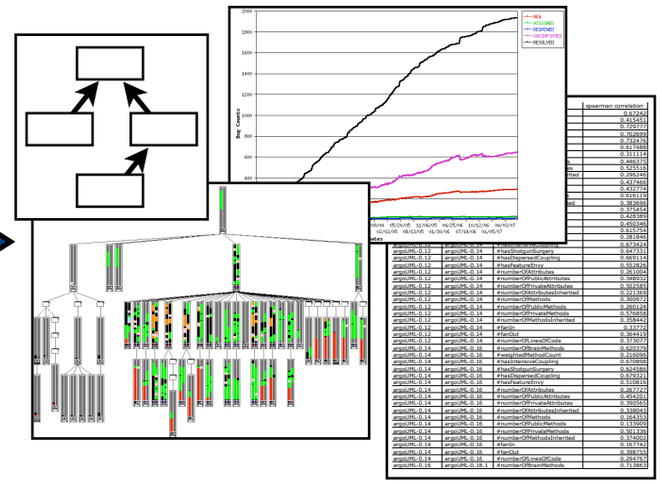
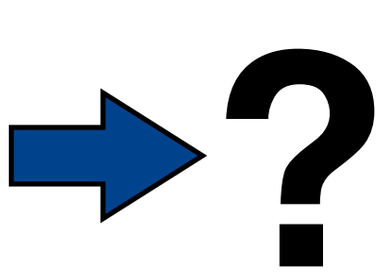
argoUML-0.16	argoUML-0.18.1	#numberOfBasicMethods	0.713863

?

Modeling results



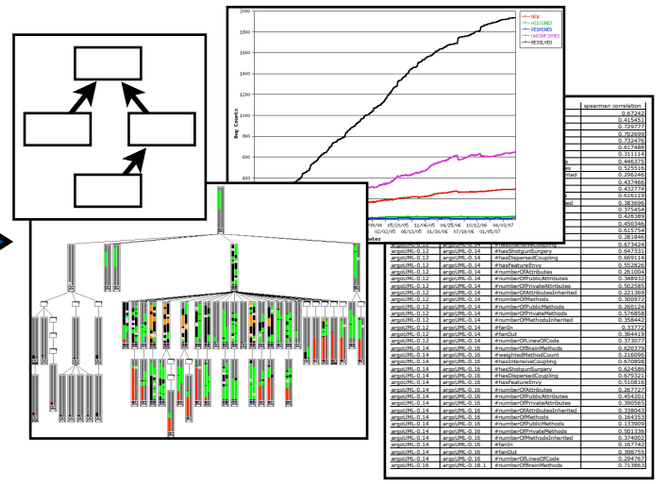


Modeling results

Class A

A.foo()

A.bar()



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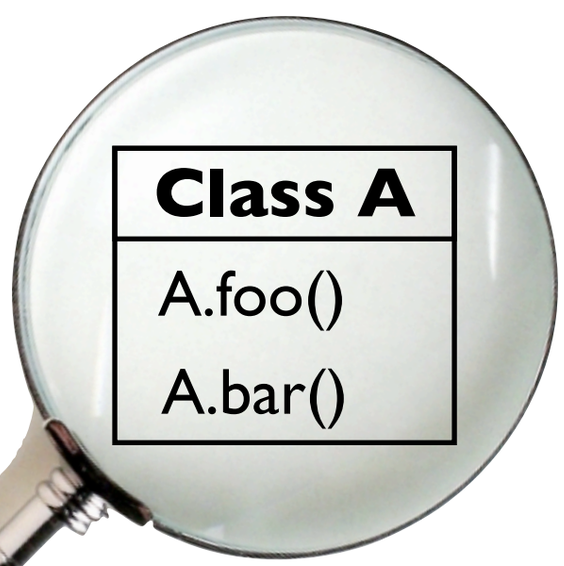
Modeling results



Annotation

Is God Class

Class A

A.foo()

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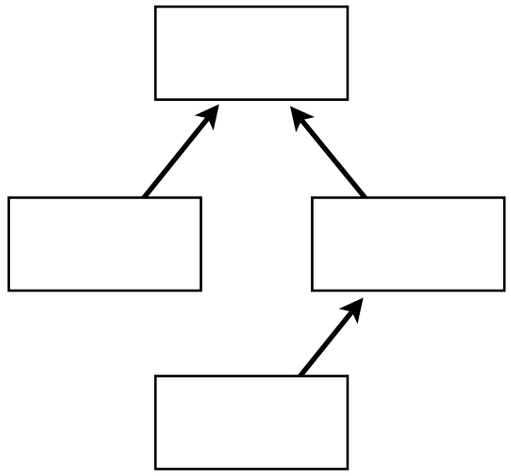


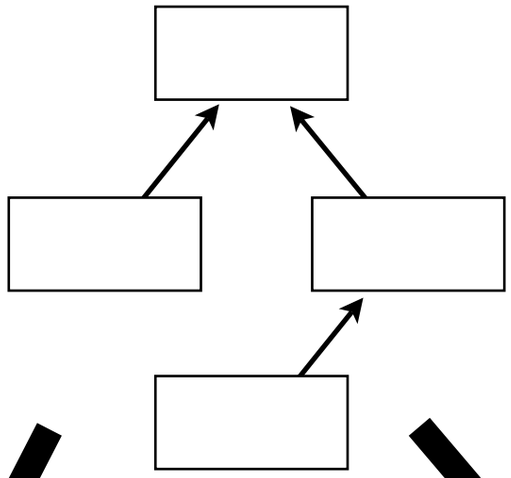
Model

Support for collaboration

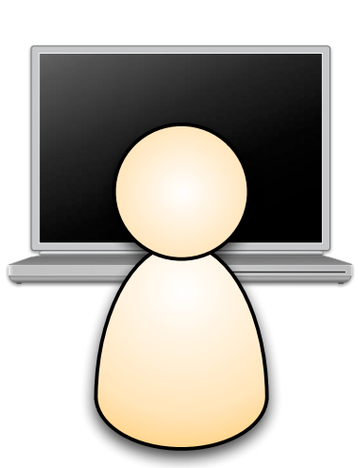
Modeling results

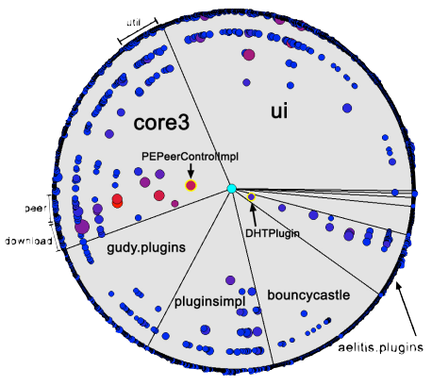
Support for collaboration

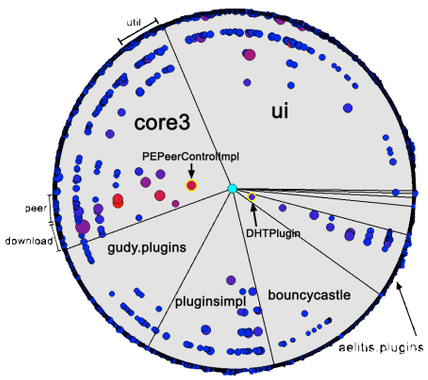
Modeling results

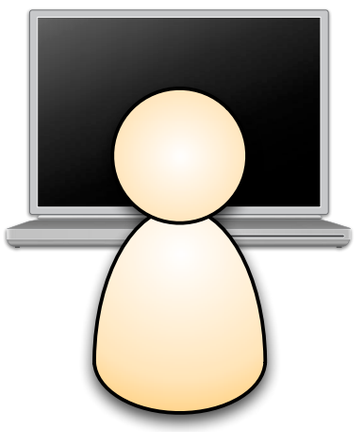


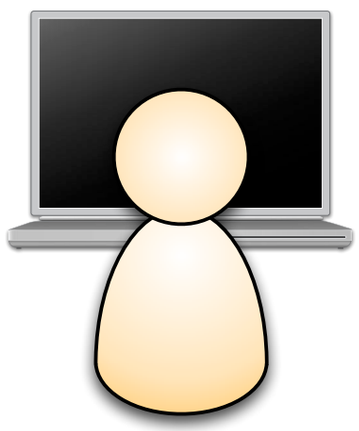
Model

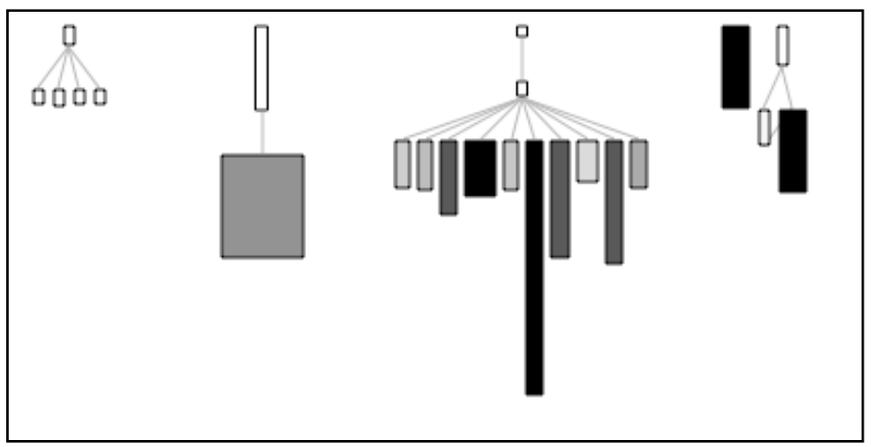






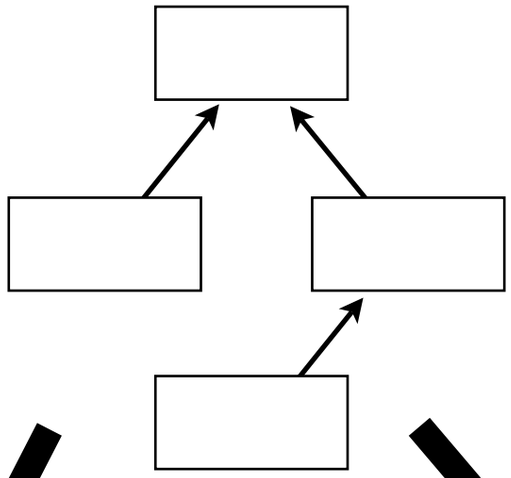




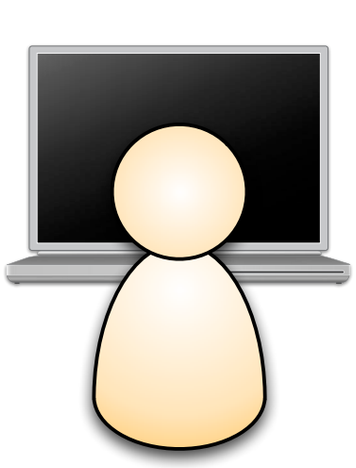


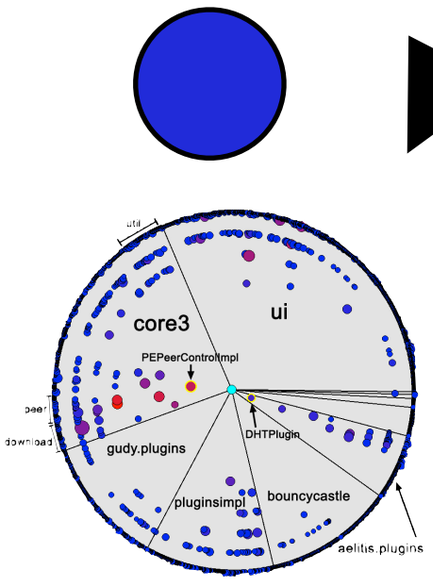
Support for collaboration

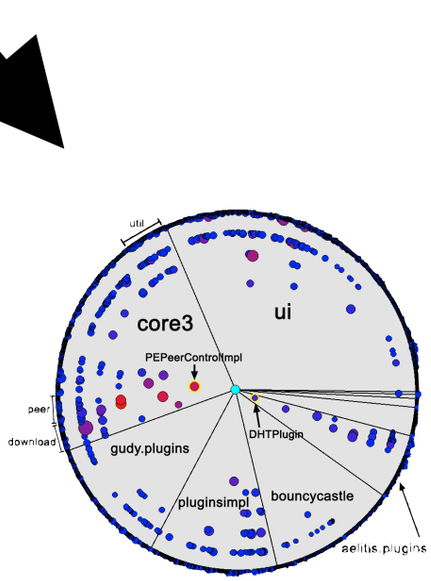
Modeling results

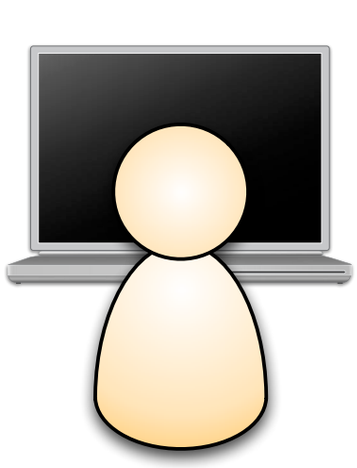


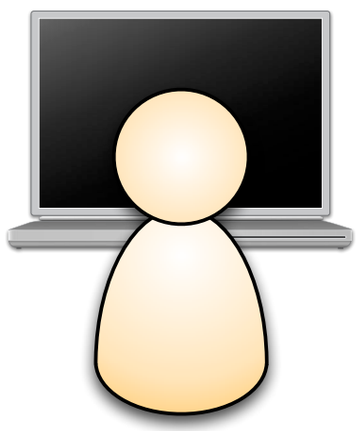
Model

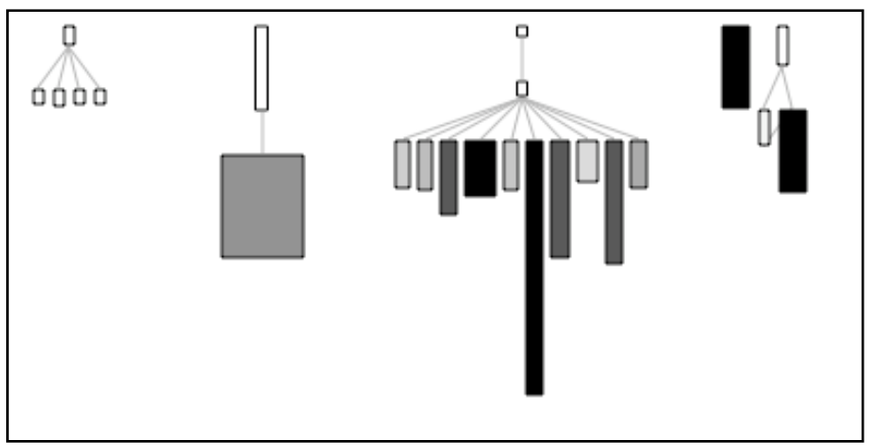






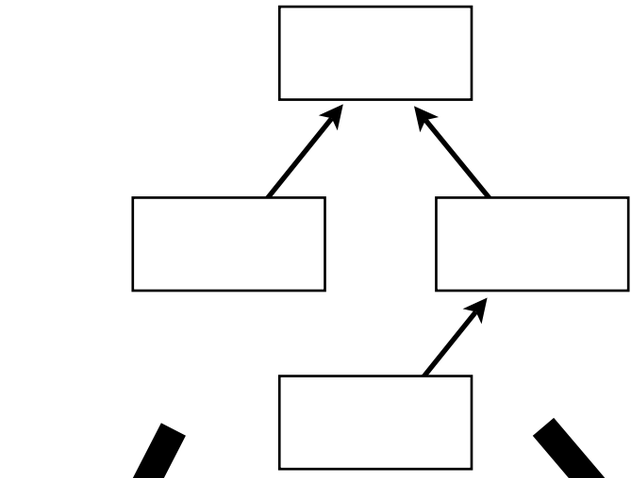






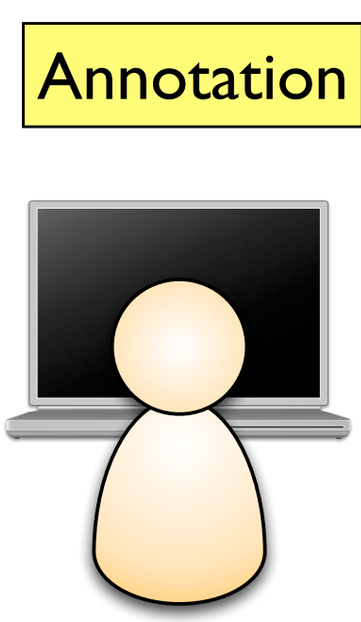
Support for collaboration

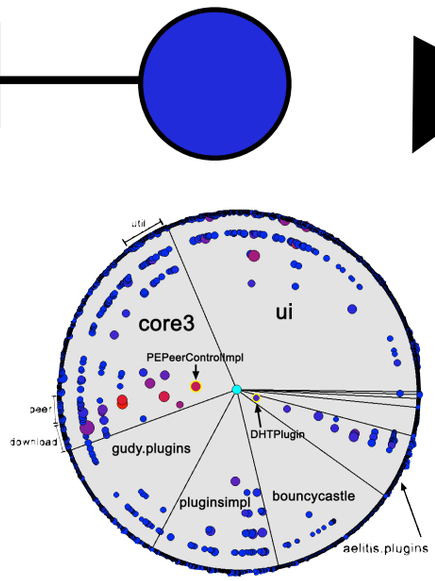
Modeling results

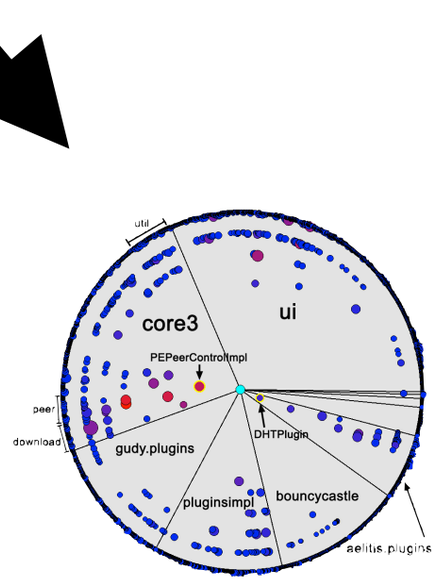


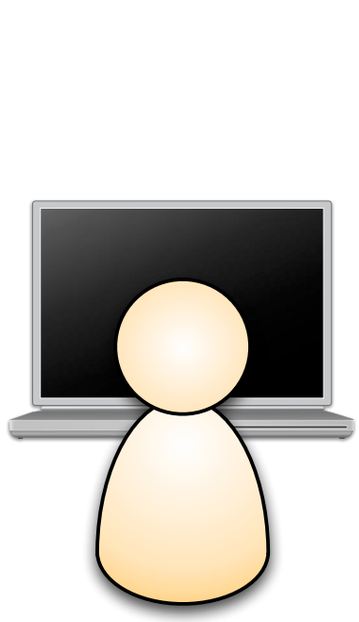
Model

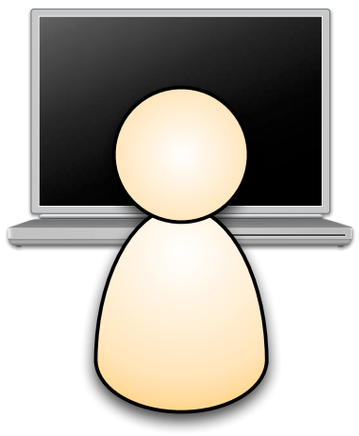
Annotation

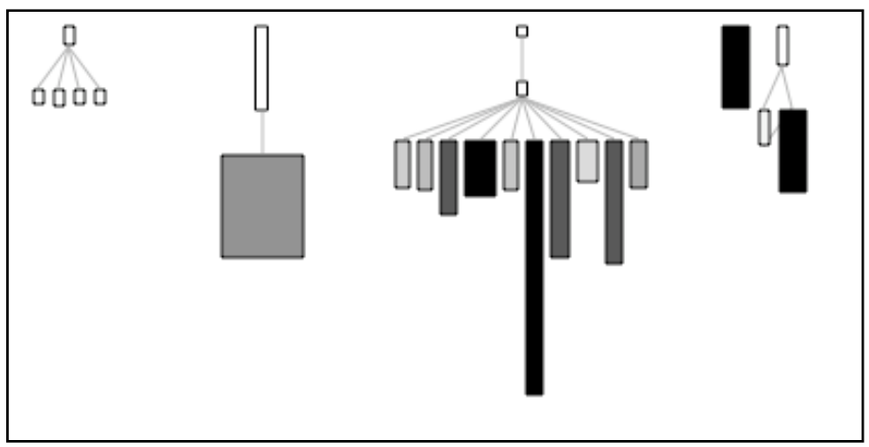






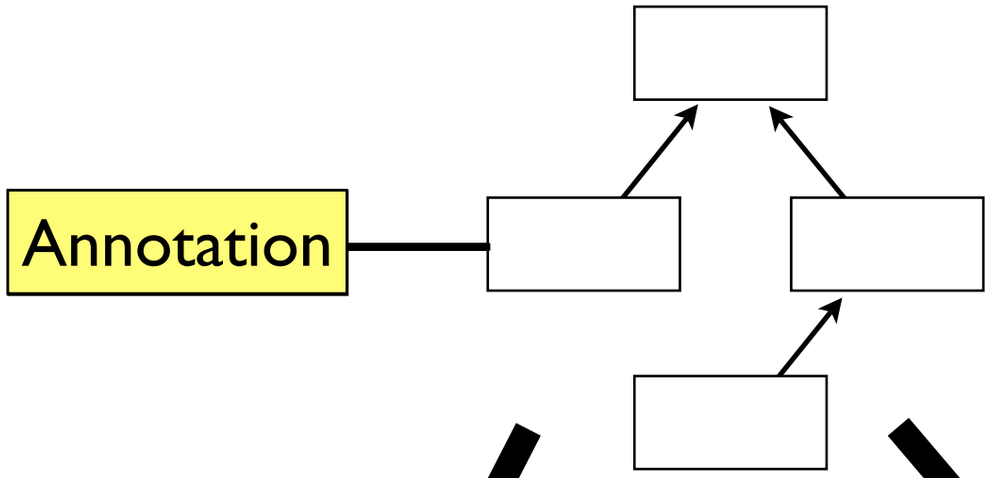






Support for collaboration

Modeling results



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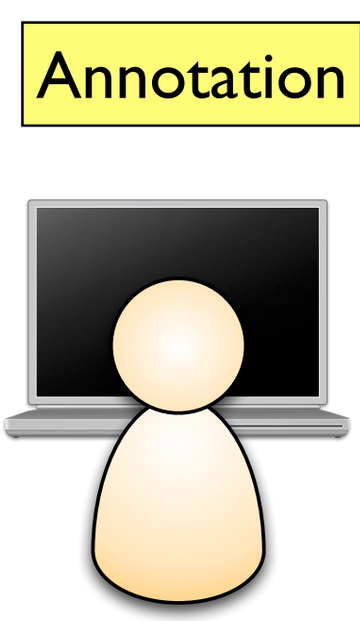
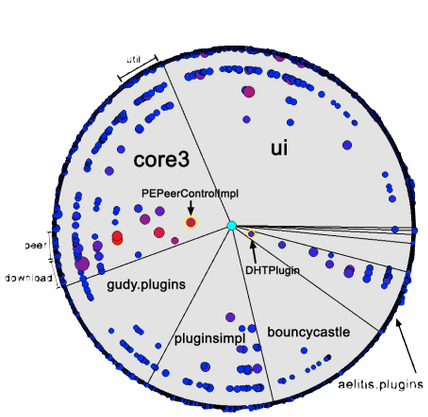
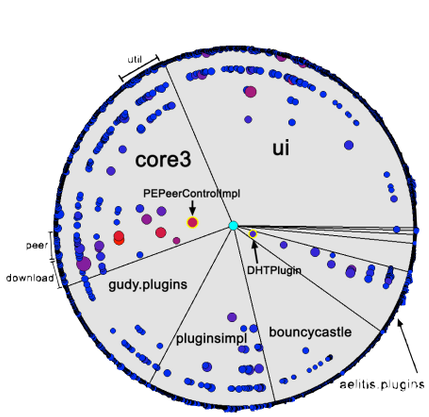
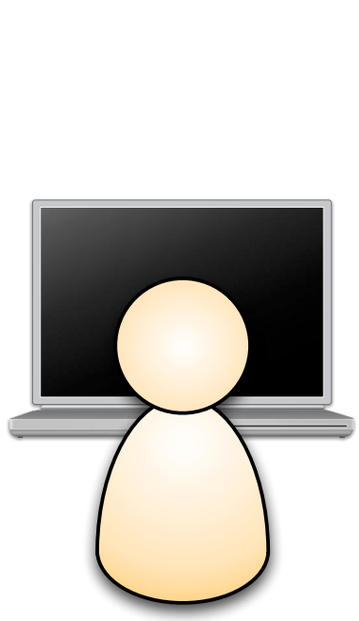
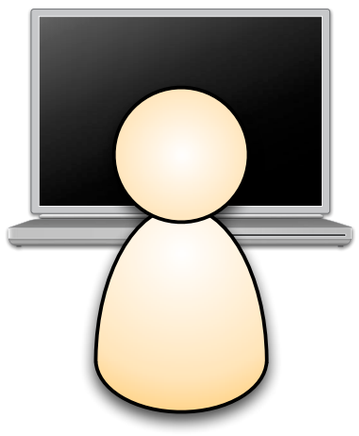
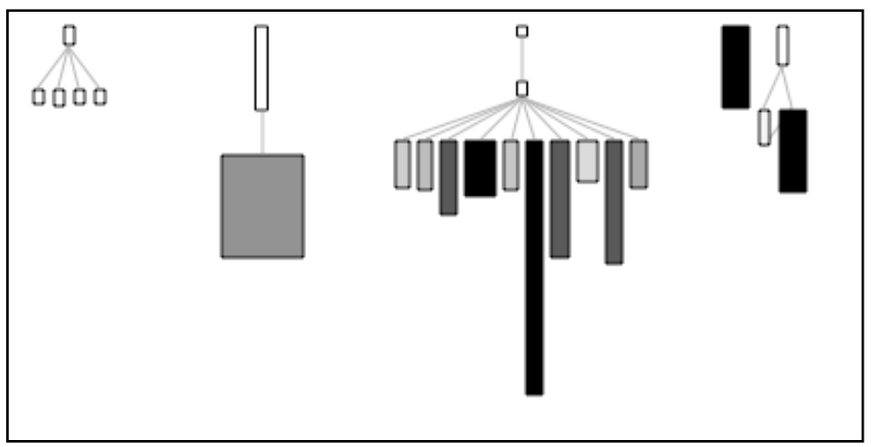












Support for collaboration

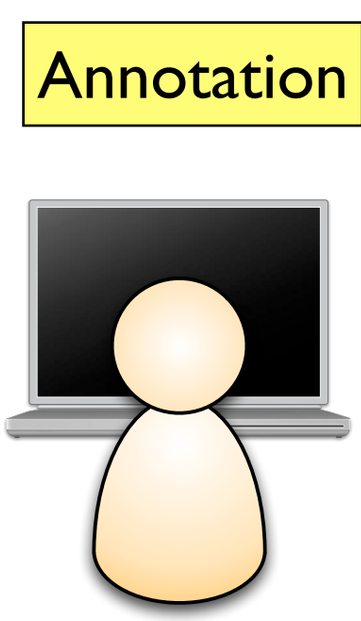
Modeling results

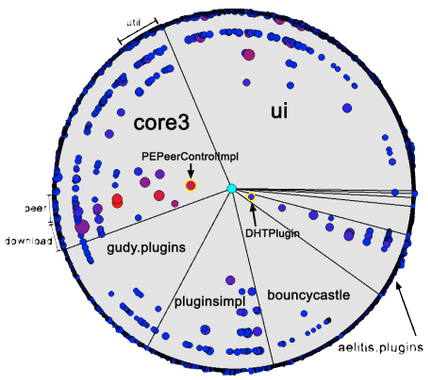
Annotation

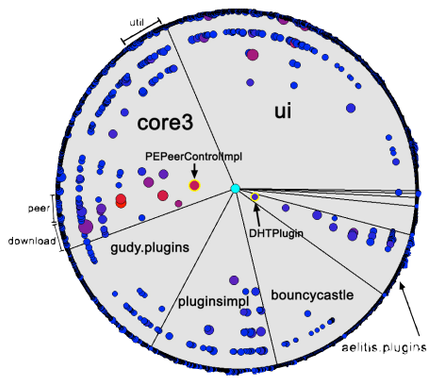
Model

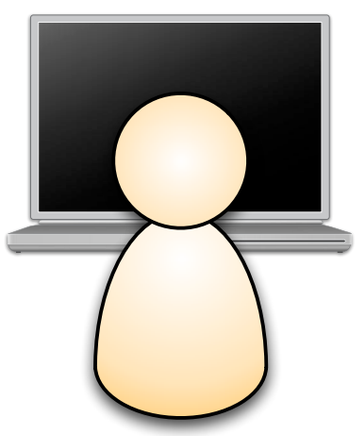
Annotation

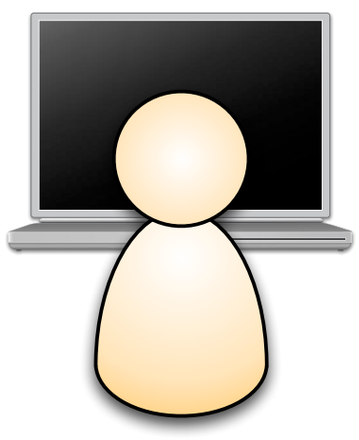
Annotation

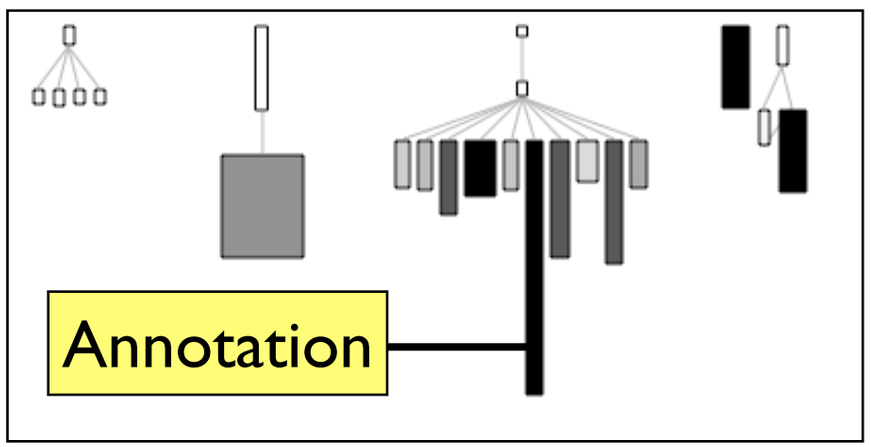


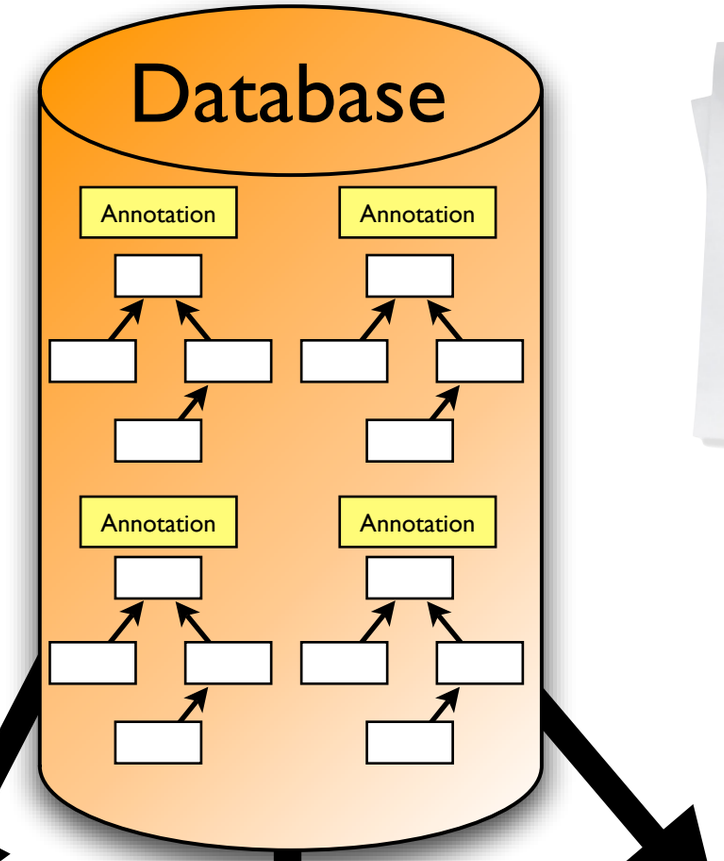






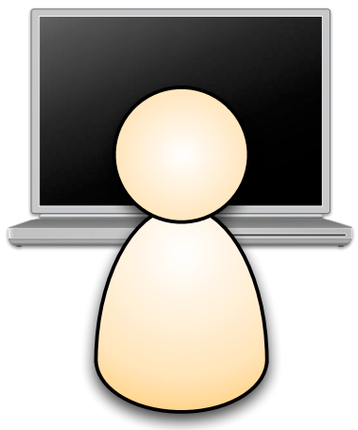


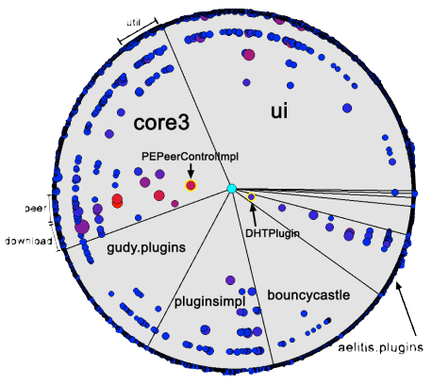


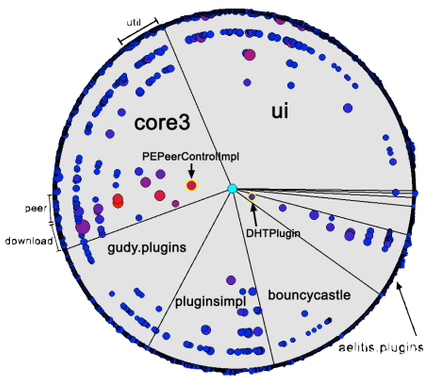


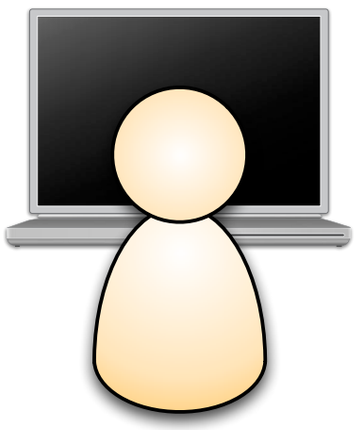
Support for collaboration

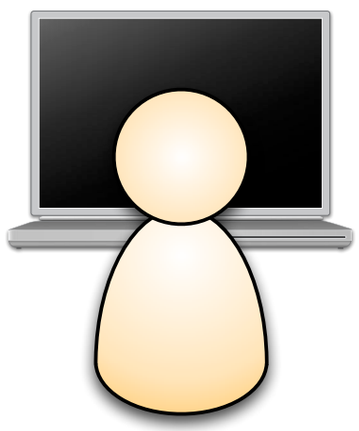
Modeling results

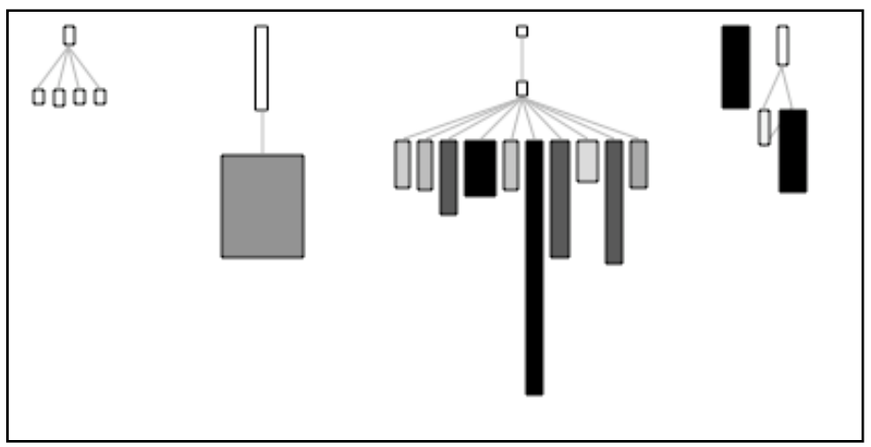


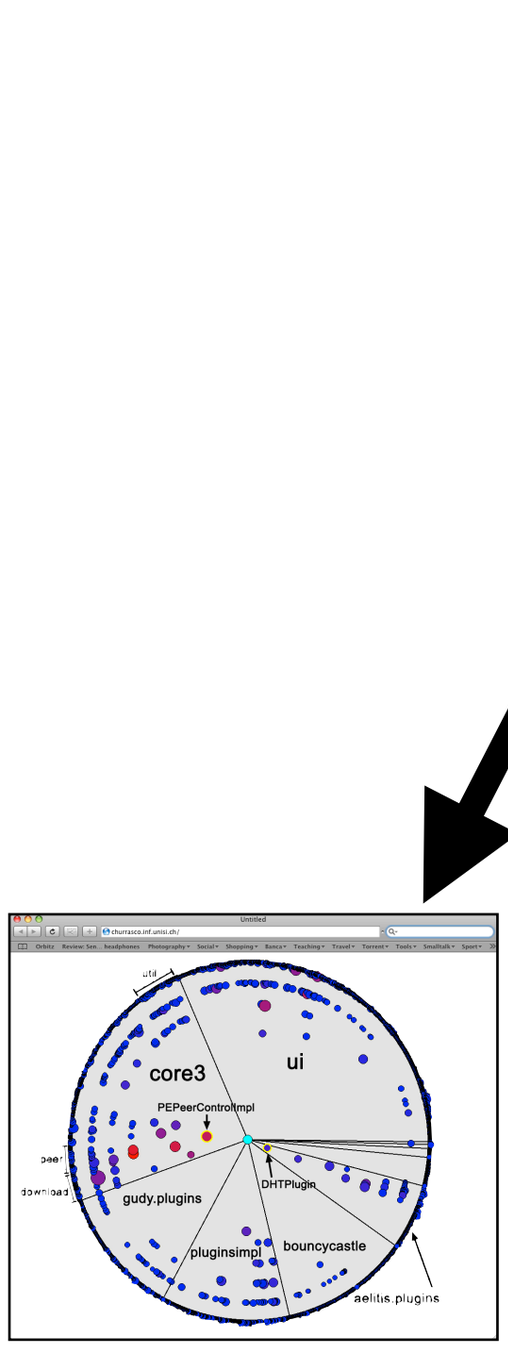


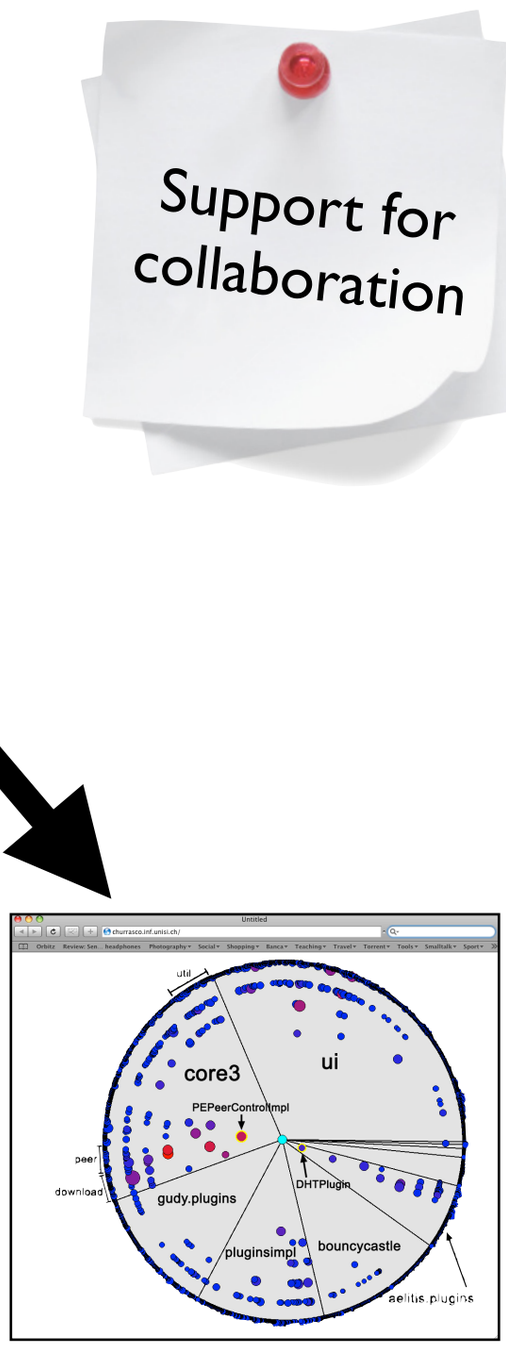


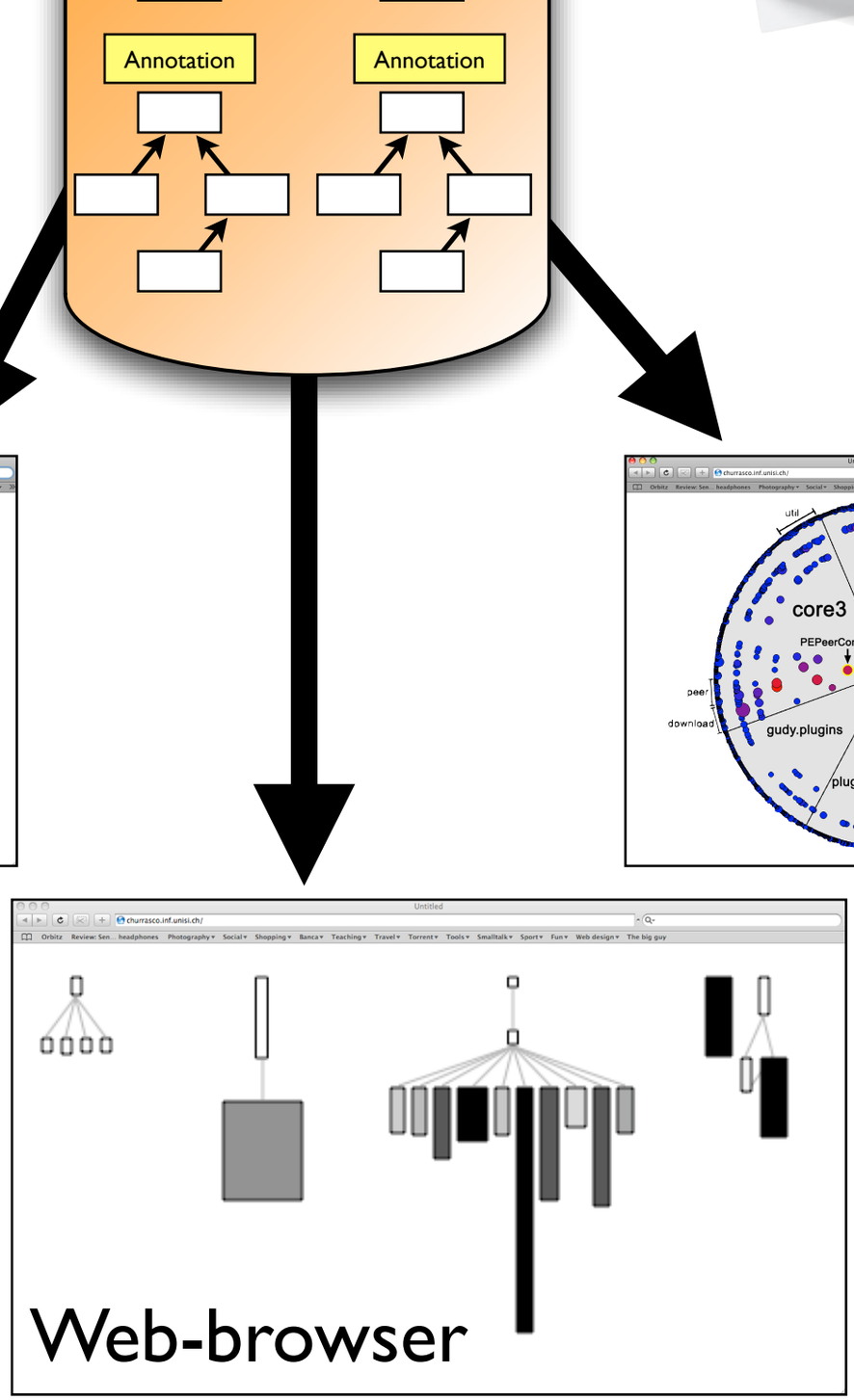


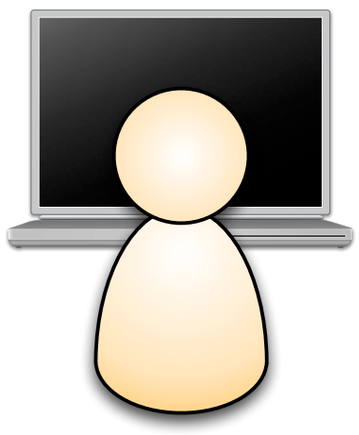






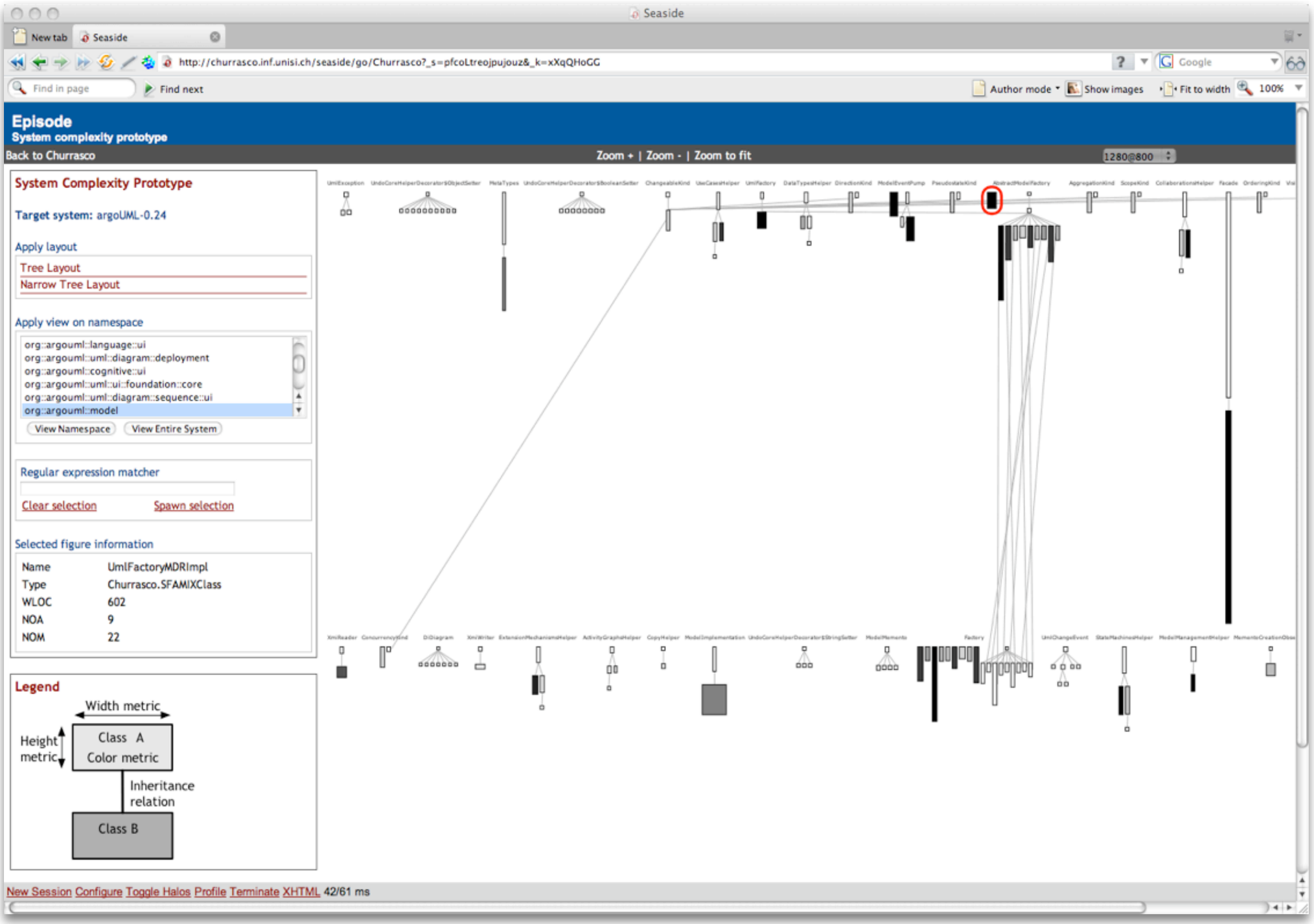






Support for collaboration

Modeling results



http://**churrasco**.inf.unisi.ch

Lessons learned

Seaside

New tab | Seaside

http://churrasco.inf.unisi.ch/seaside/go/Churrasco?_s=pfcoLtreojpujouz&_k=xXqQHoGG

Find in page | Find next | Author mode | Show images | Fit to width | 100%

Episode
System complexity prototype

Back to Churrasco | Zoom + | Zoom - | Zoom to fit | 1280@800

System Complexity Prototype

Target system: argoUML-0.24

Apply layout

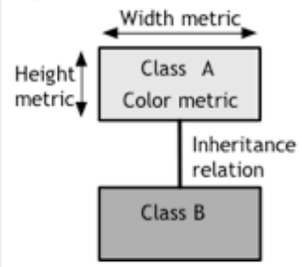
Tree Layout

Narrow Tree La...

Selected figure information

Name	UmlFactoryMDRImpl
Type	Churrasco.SFAMIXClass
WLOC	602
NOA	9
NOM	22

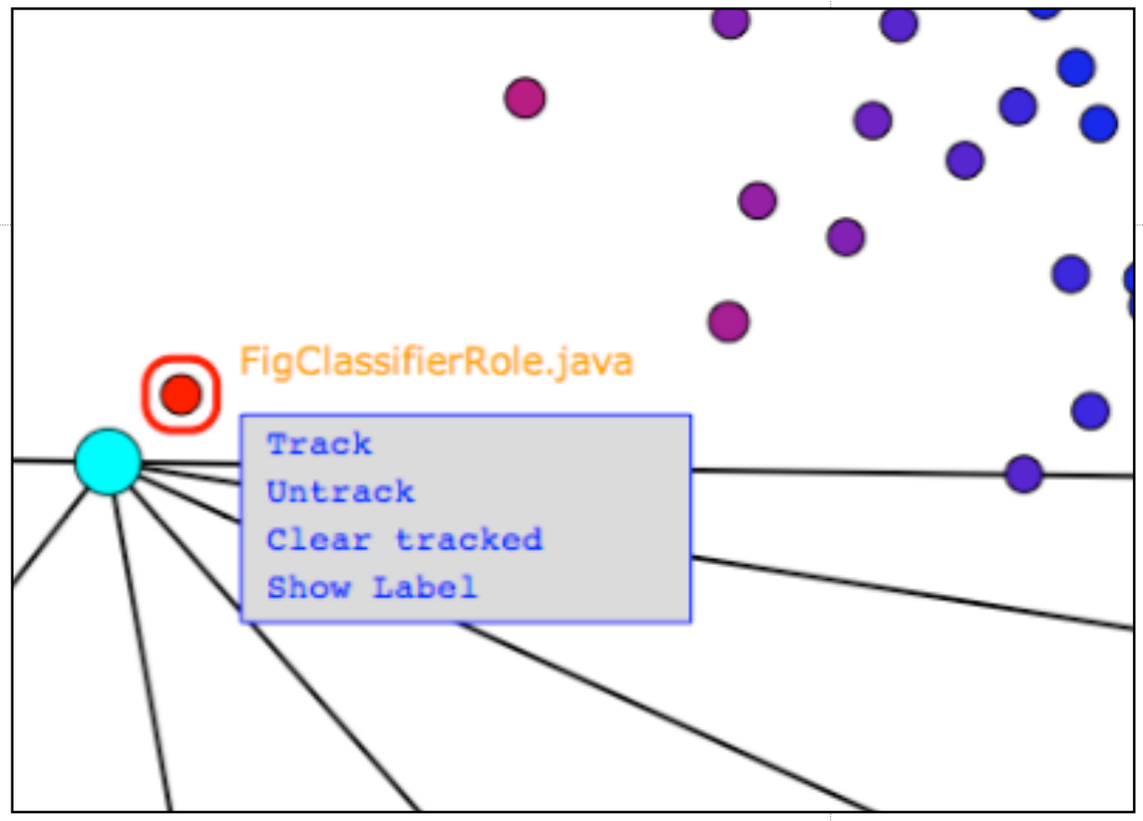
Legend



New Session Configure Toggle Halos Profile Terminate XHTML 42/61 ms

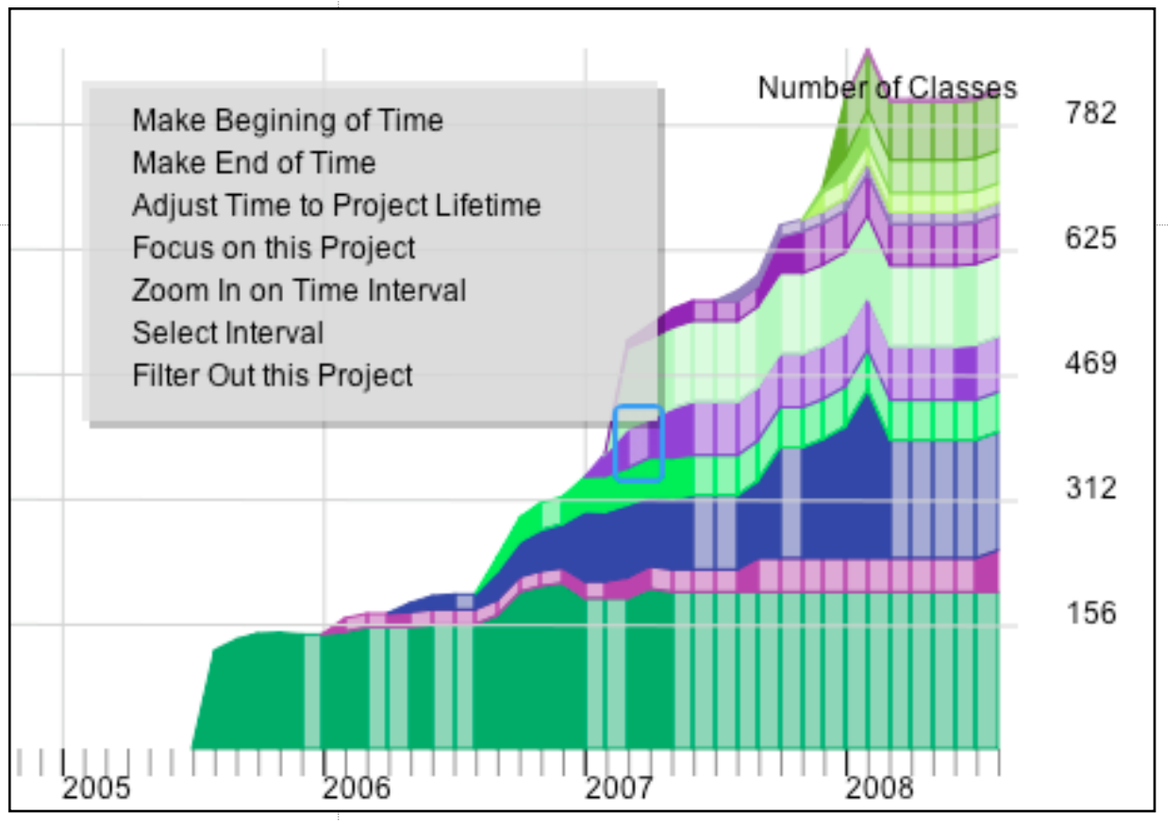
Interaction

Churrasco



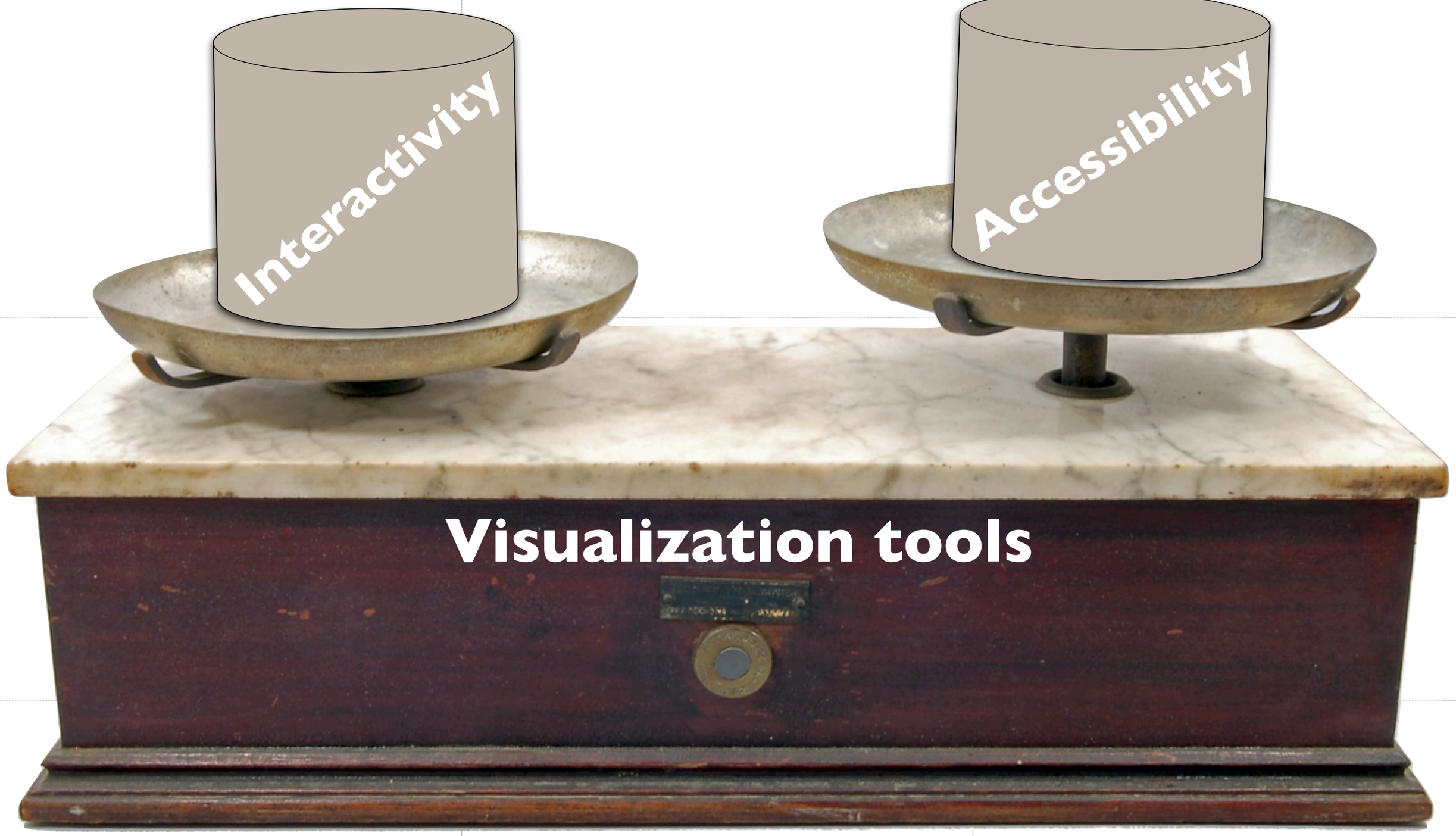
SVG
Server-side

SPO



Javascript
Client-side

Interaction



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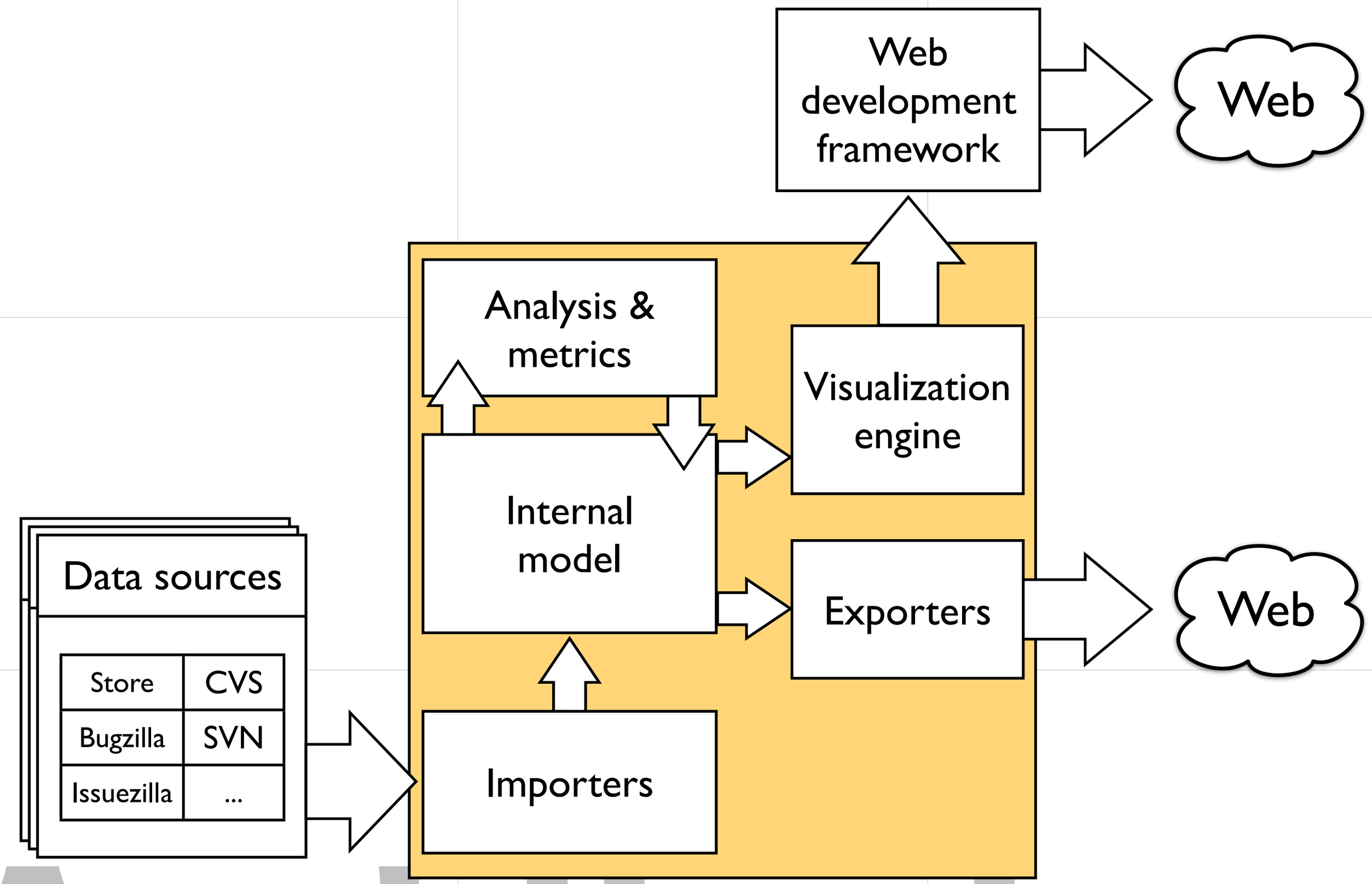
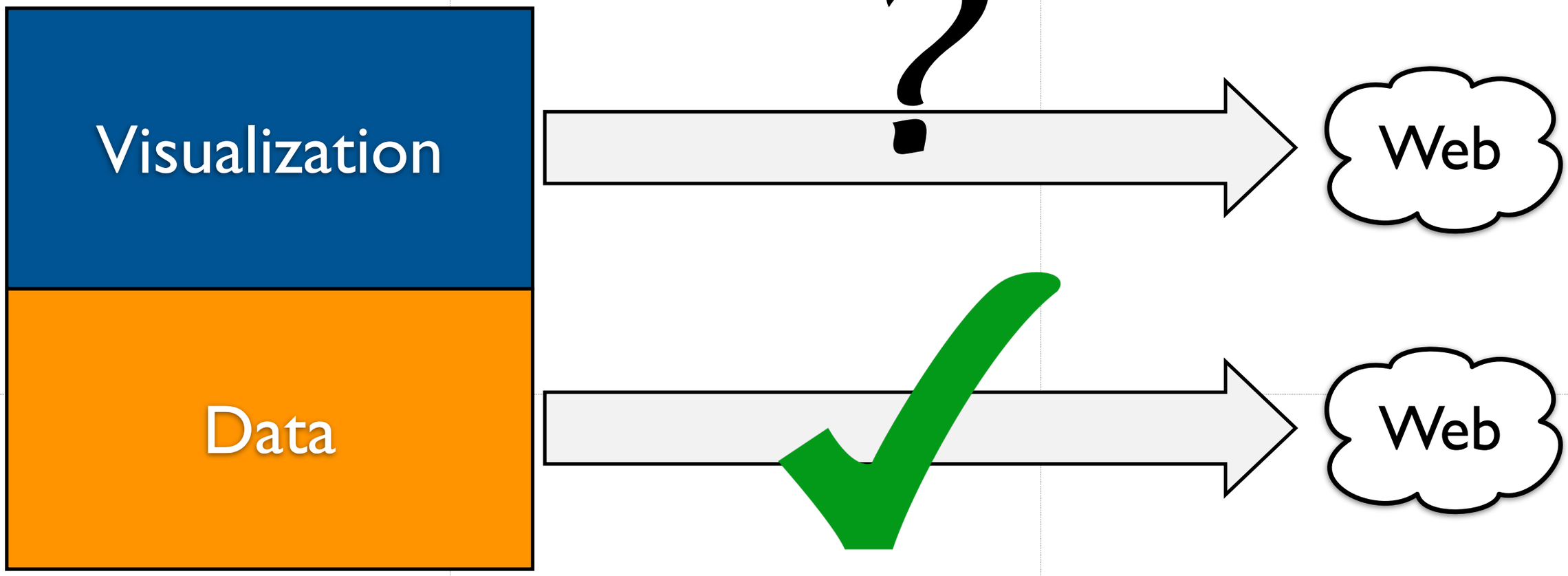


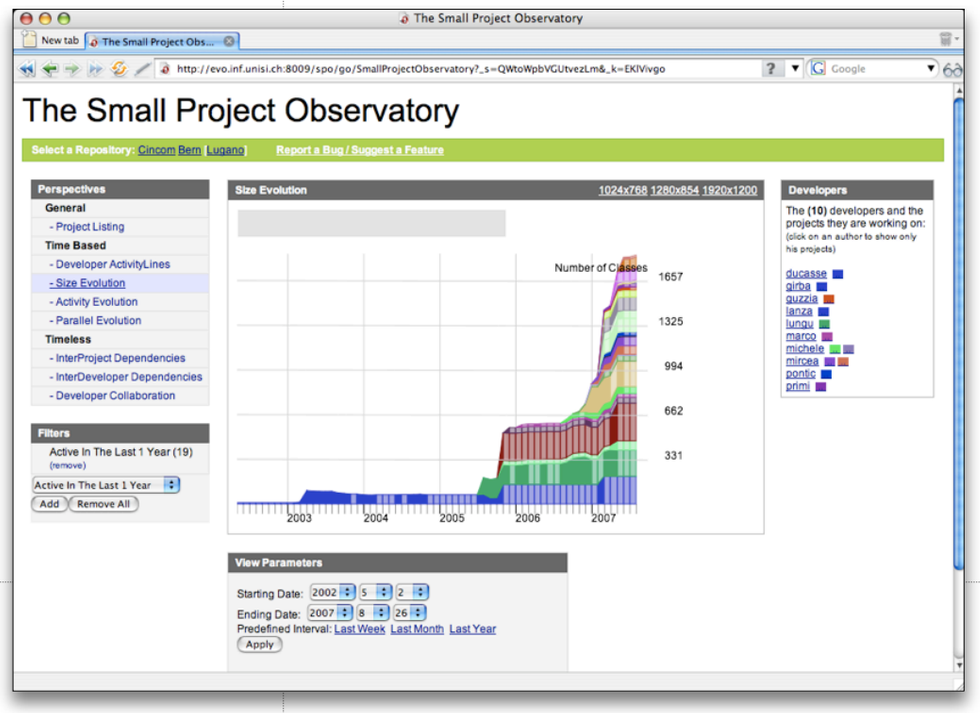
Architecture



Why?

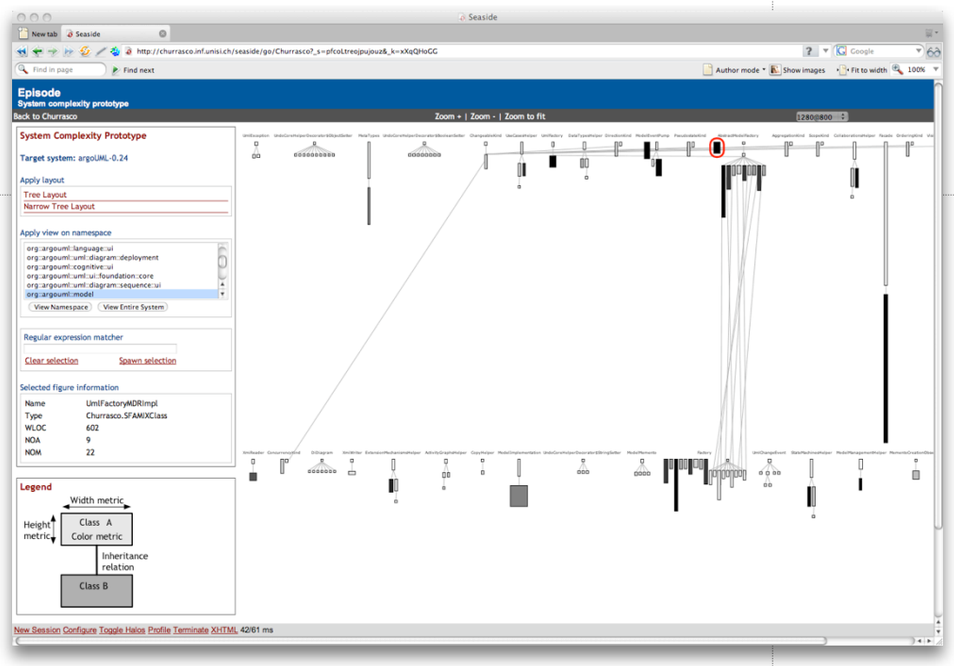
1. Not re-implementing the importers over and over
2. Exporters are easier (than importers) to implement
3. Allowing for flexibility

Architecture

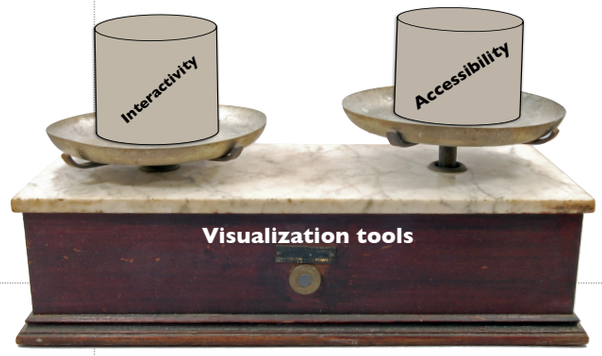


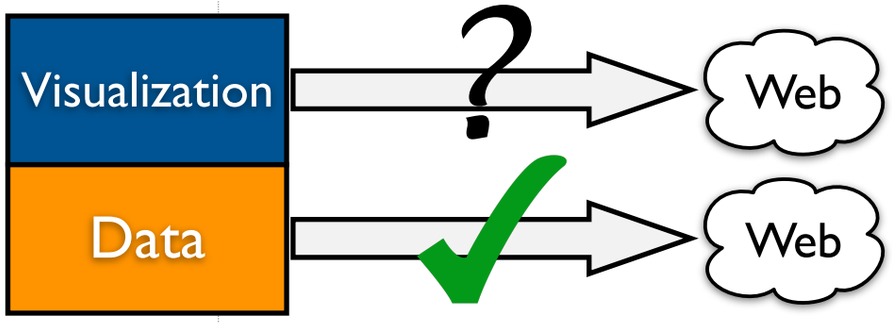
Motivation

http://www.inf.unisi.ch/phd/lungu/**spo**



http://**churrasco**.inf.unisi.ch





Lessons learned