2.– 5. September 2013
in Nürnberg

Herbstcampus

Wissenstransfer
par excellence

Nachgemessen und angezeigt

Code Metriken

Thomas Haug

MATHEMA Software GmbH

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Agenda

- Motivation
- CodeCity
- Moose
- Hybrid Modelle
- Zusammenfassung

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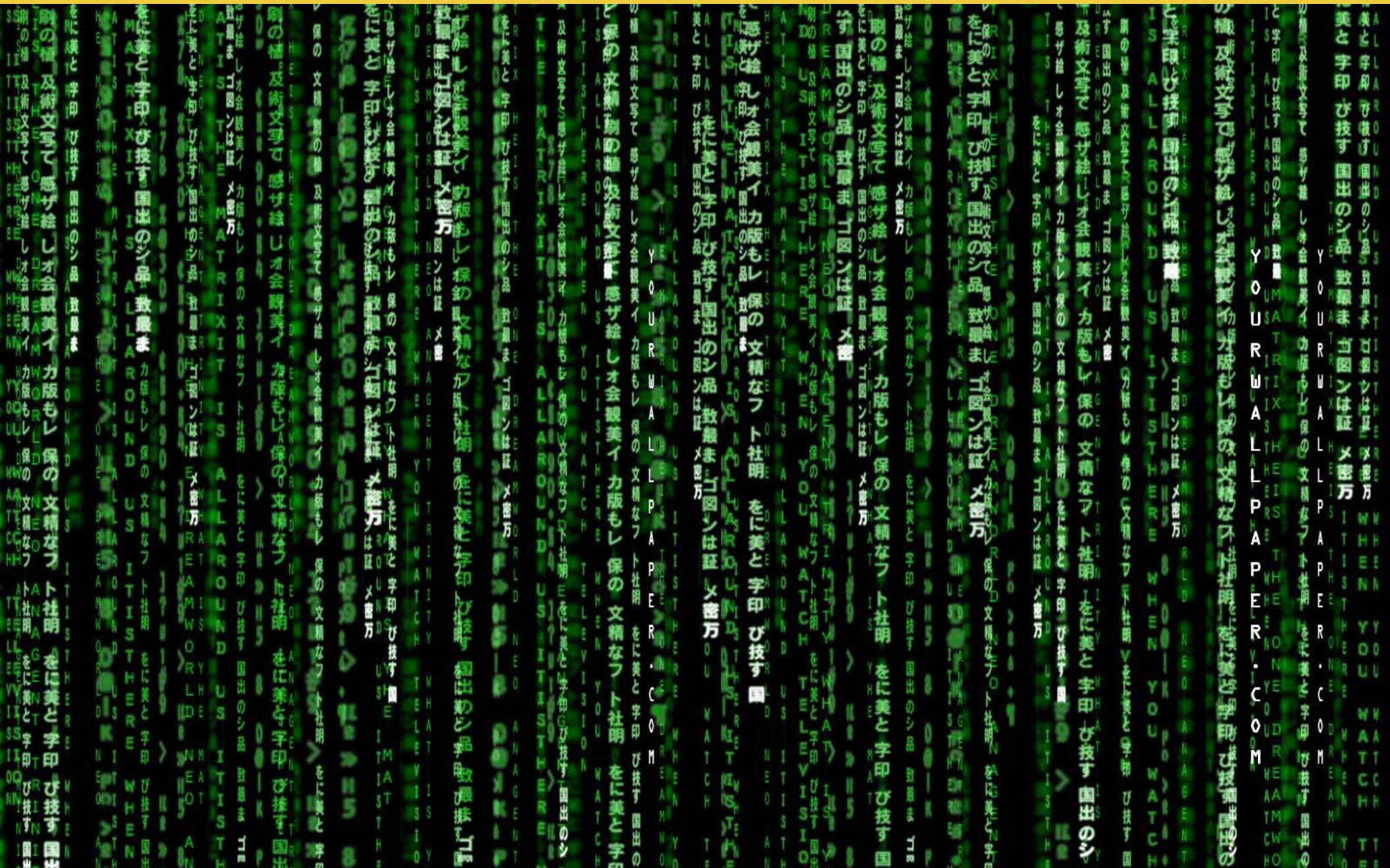
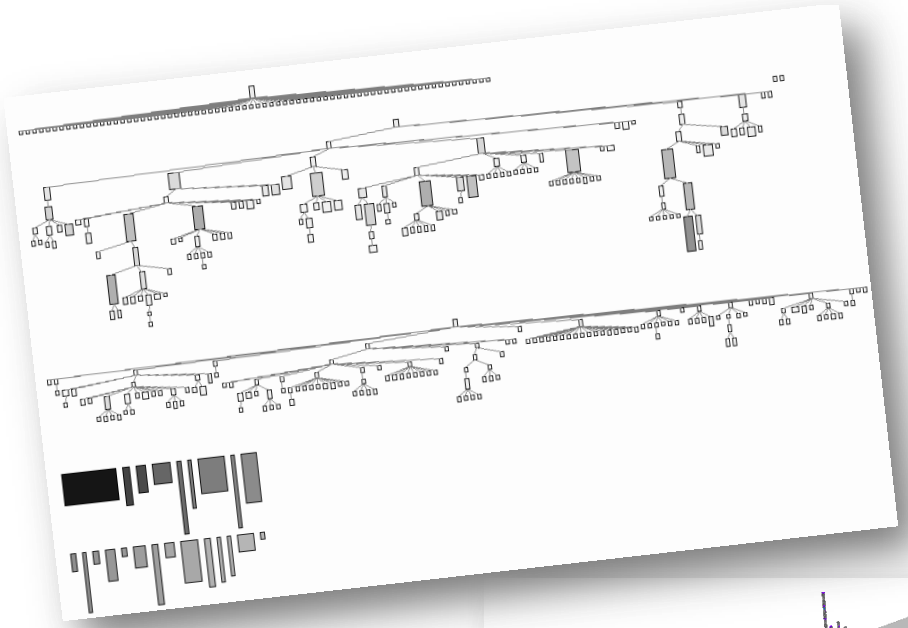
Motivation

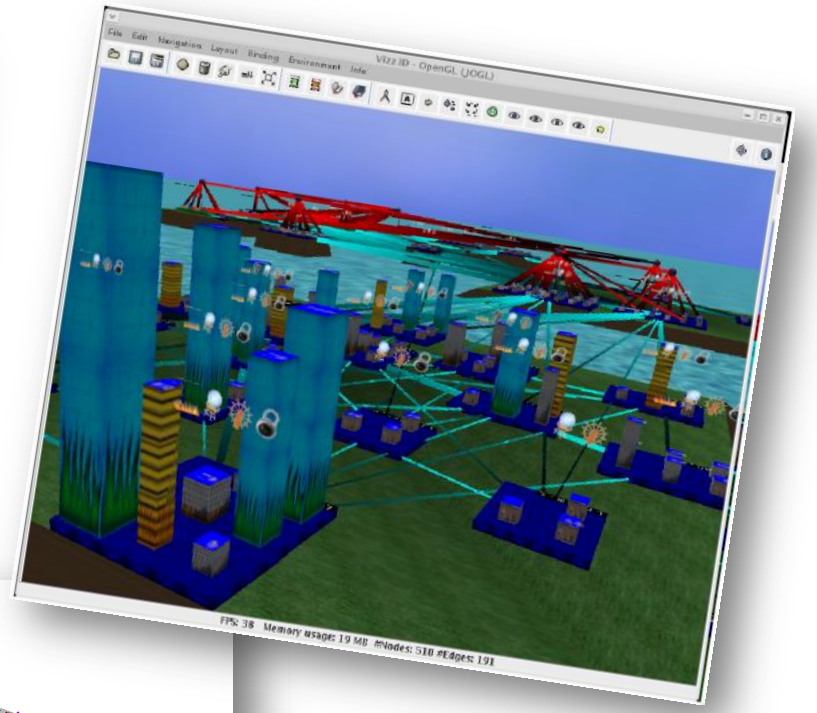


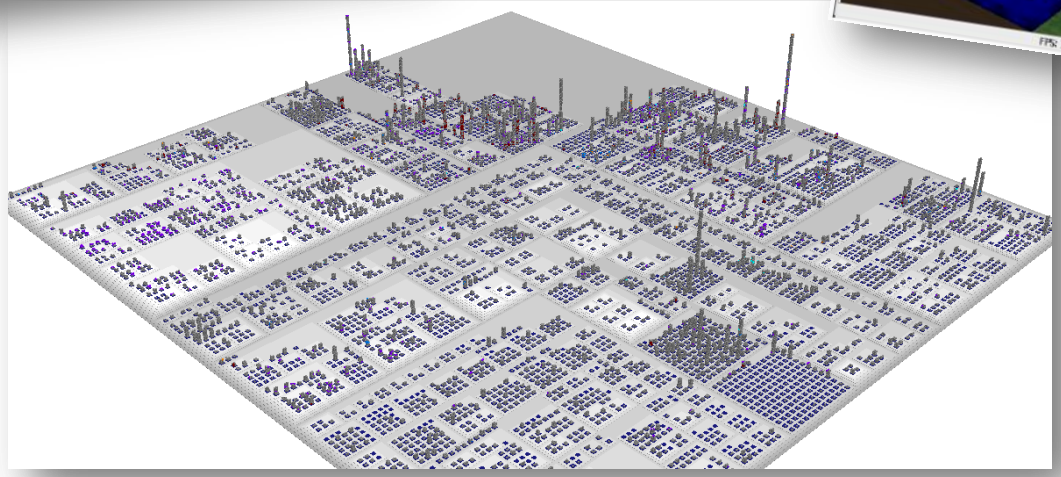
Motivation

“Overview first, zoom and filter, then details-on-demand”

B. Shneiderman







Moose und CodeCity

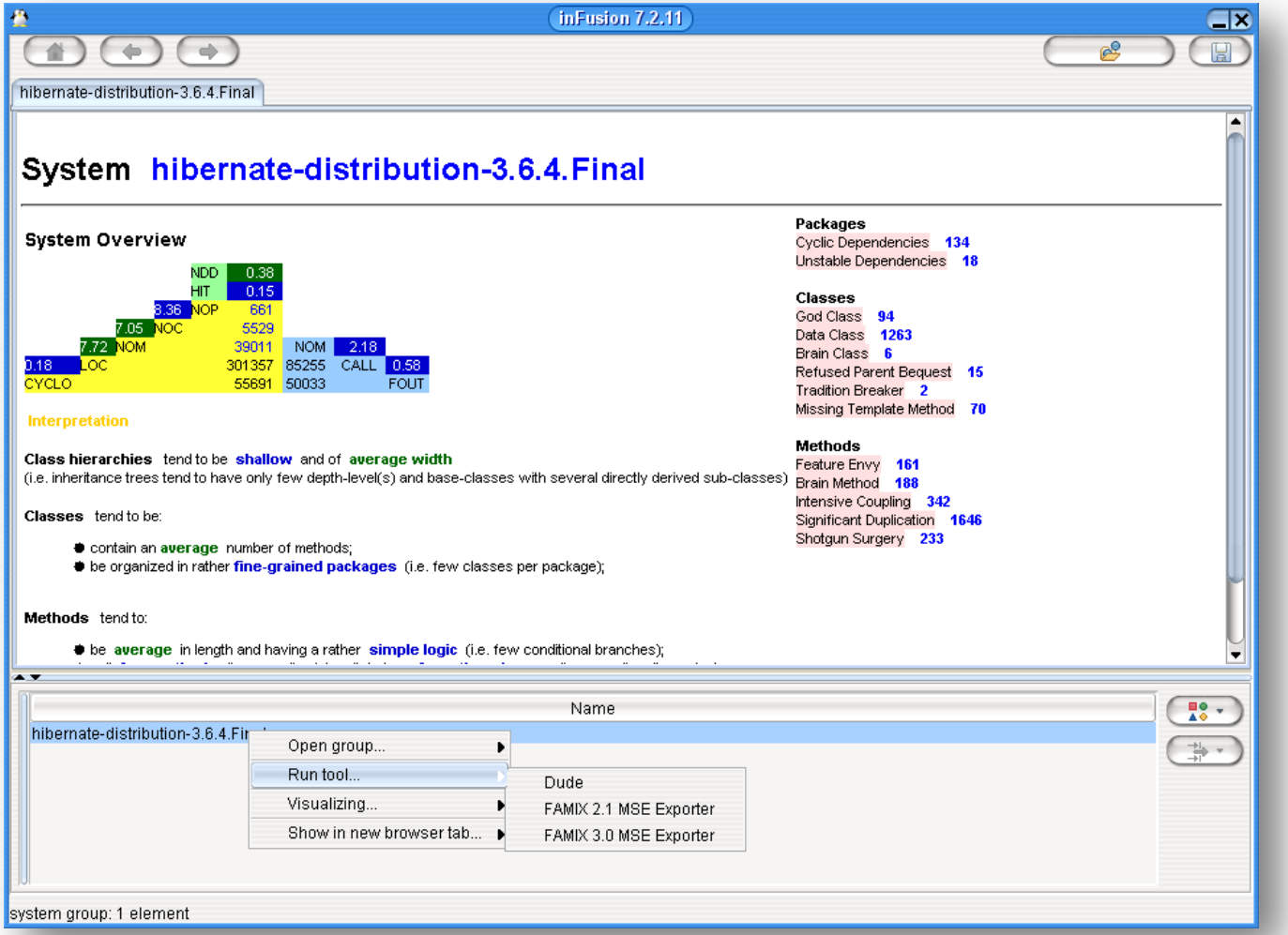
- Entstammen aus Forschungsvorhaben

- Sind in Smalltalk implementiert

> **Try not to care.** Beginning **Smalltalk programmers often have trouble** because they think they need to understand all the details of how a thing works before they can use it. This means it takes quite a while before they can master
>
> ```
> Transcript show: 'Hello World'.
> ```
>
> One of the **great leaps in OO** is to be able to answer the question "How does this work?" with "**I don't care**".
>
> Alain Knight

Famix Modell erzeugen

- inFusion (http://www.intooitus.com/products/infusion)
- Sprachen
  - Java
  - C++
  - C
- kostenpflichtig



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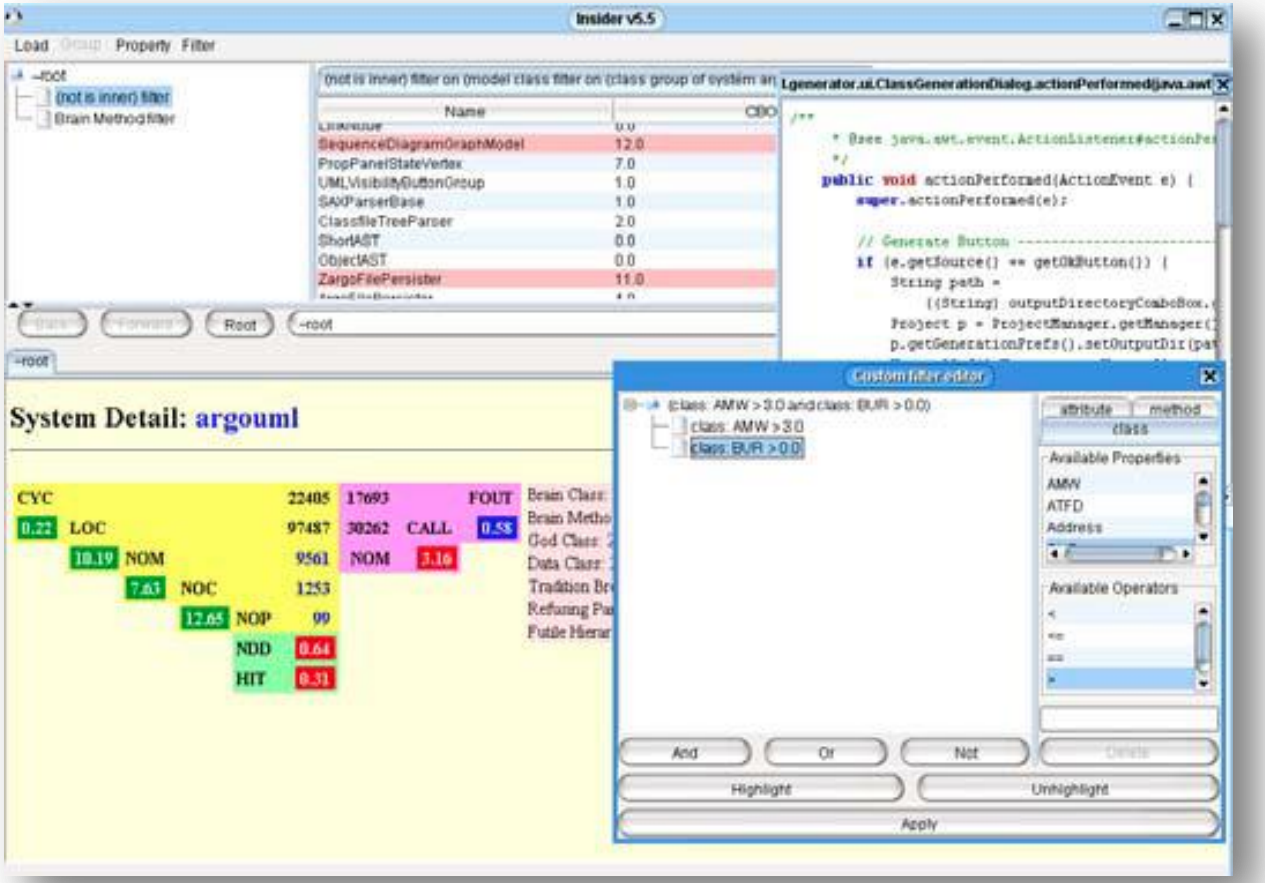
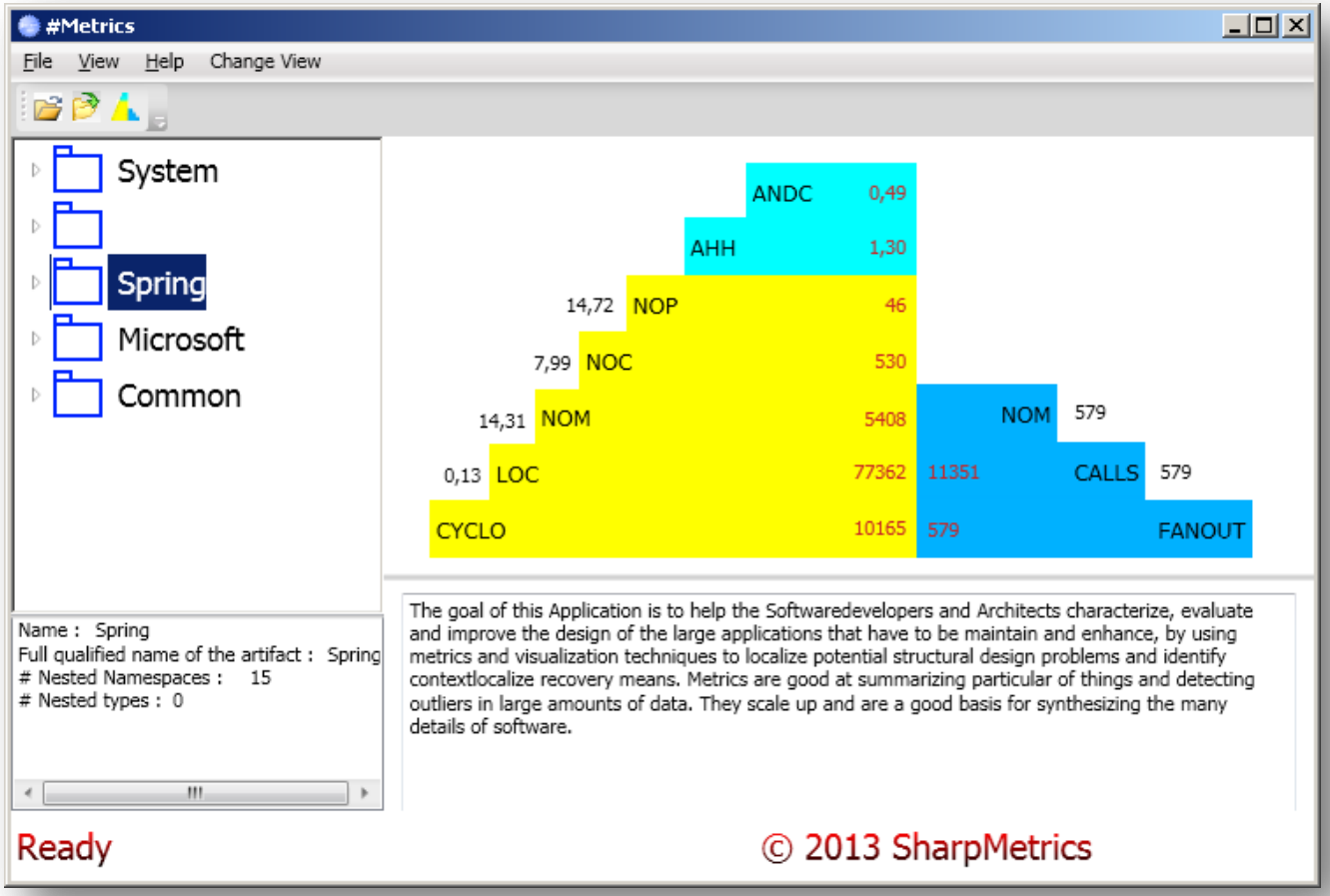
Famix Modell erzeugen

- iplasma (http://loose.upt.ro/reengineering/research/iplasma)
- Sprachen
  - Java
  - C++
  - C
- freiverfügbar



Famix Modell erzeugen

- SharpMetrics (http://www.sharpmetrics.net)
- Sprachen
  - C#
  - *Sonar Import*
- *freiverfügbar*



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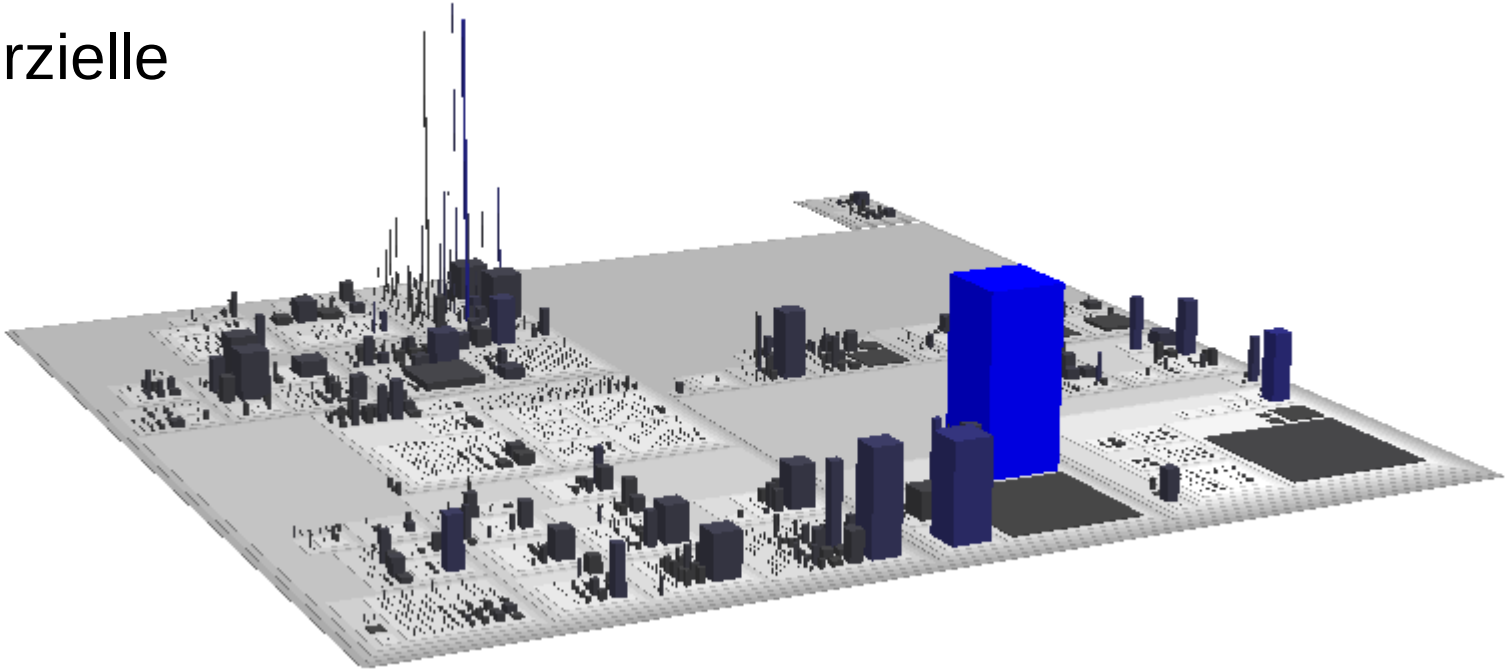
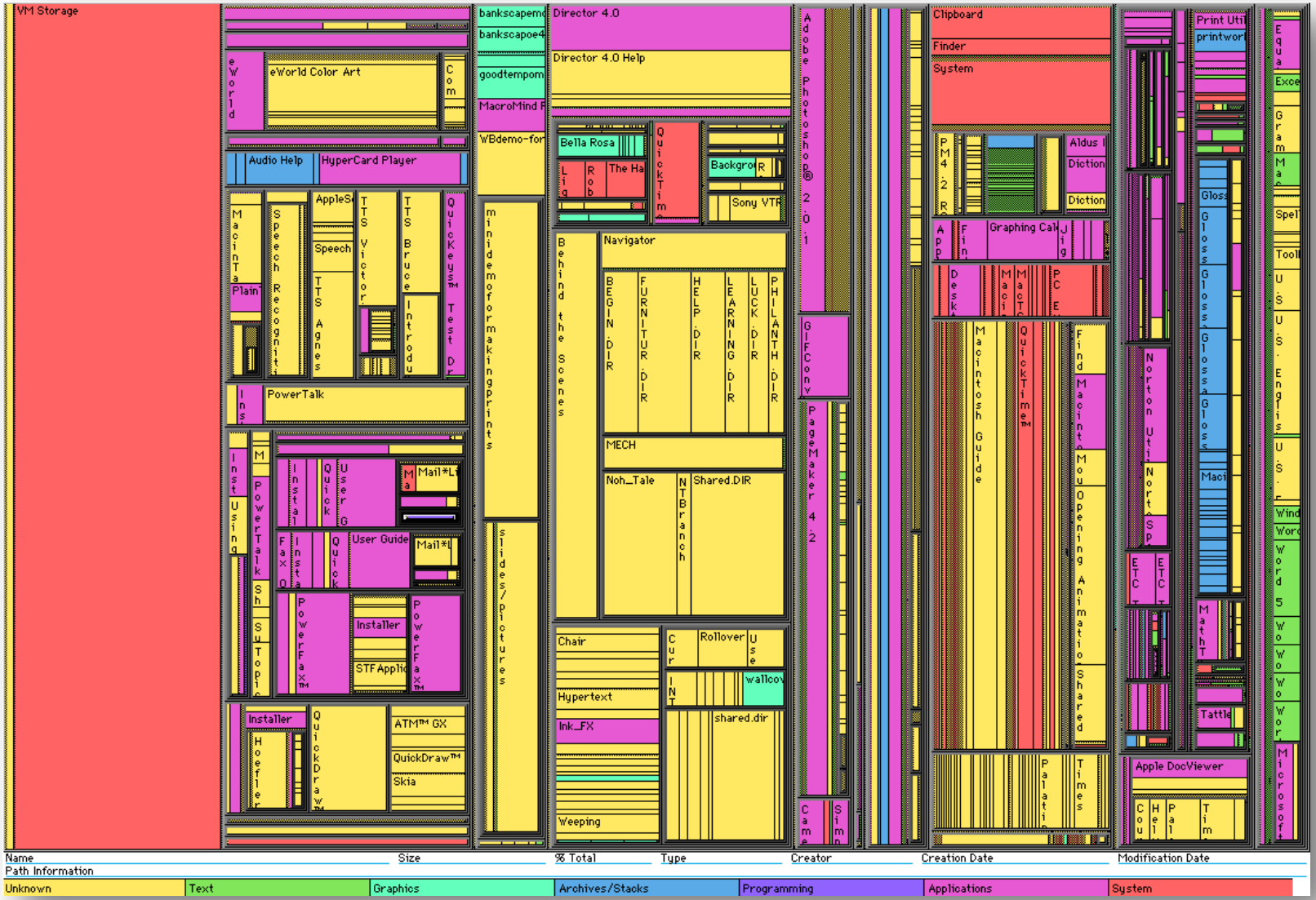
CodeCity

- Städtemetapher zur 3D Darstellung von Code
- Basiert auf Moose
- Aktuelle Version 1.4.3 (2009)
- http://www.inf.usi.ch/phd/wettel/codecity.html
- Nicht-kommerzielle Nutzung



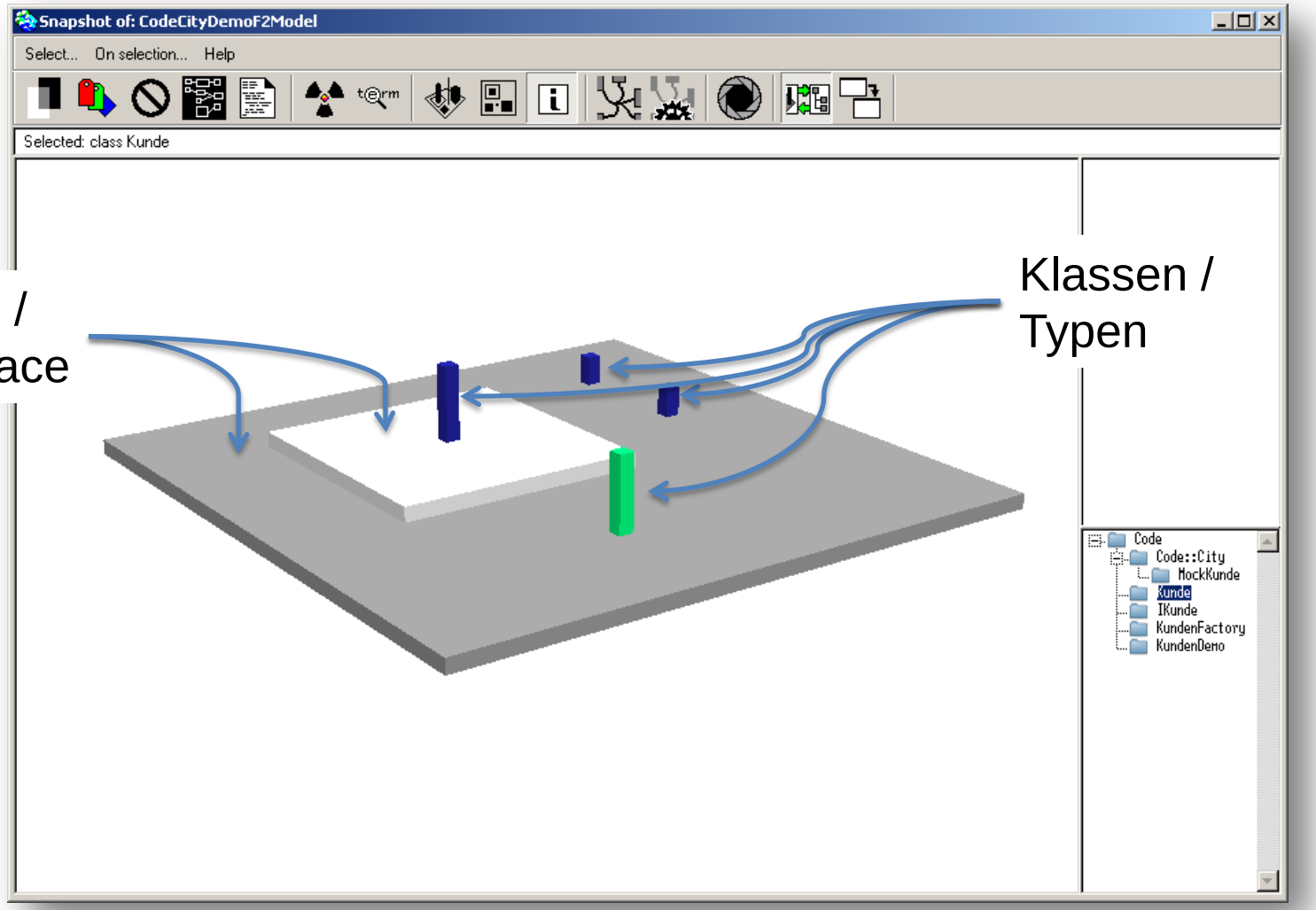
CodeCity – Treemap als Grundlage

Ben Shneiderman



http://www.cs.umd.edu/hcil/treemap-history/treeviz_colorful.gif

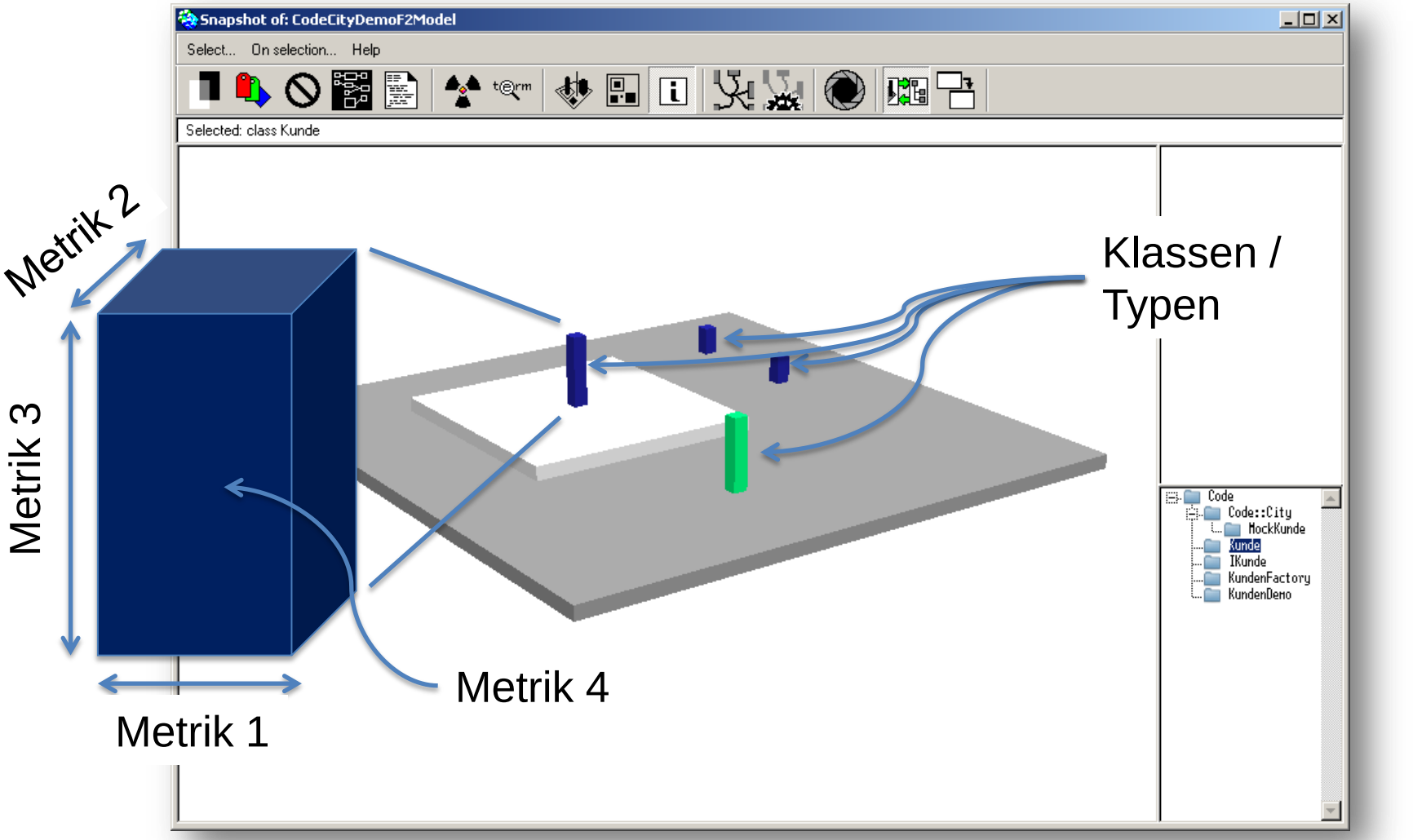
CodeCity – Die Städtemethaper



Package / Namespace

Klassen / Typen

CodeCity – Die Städtemethaper

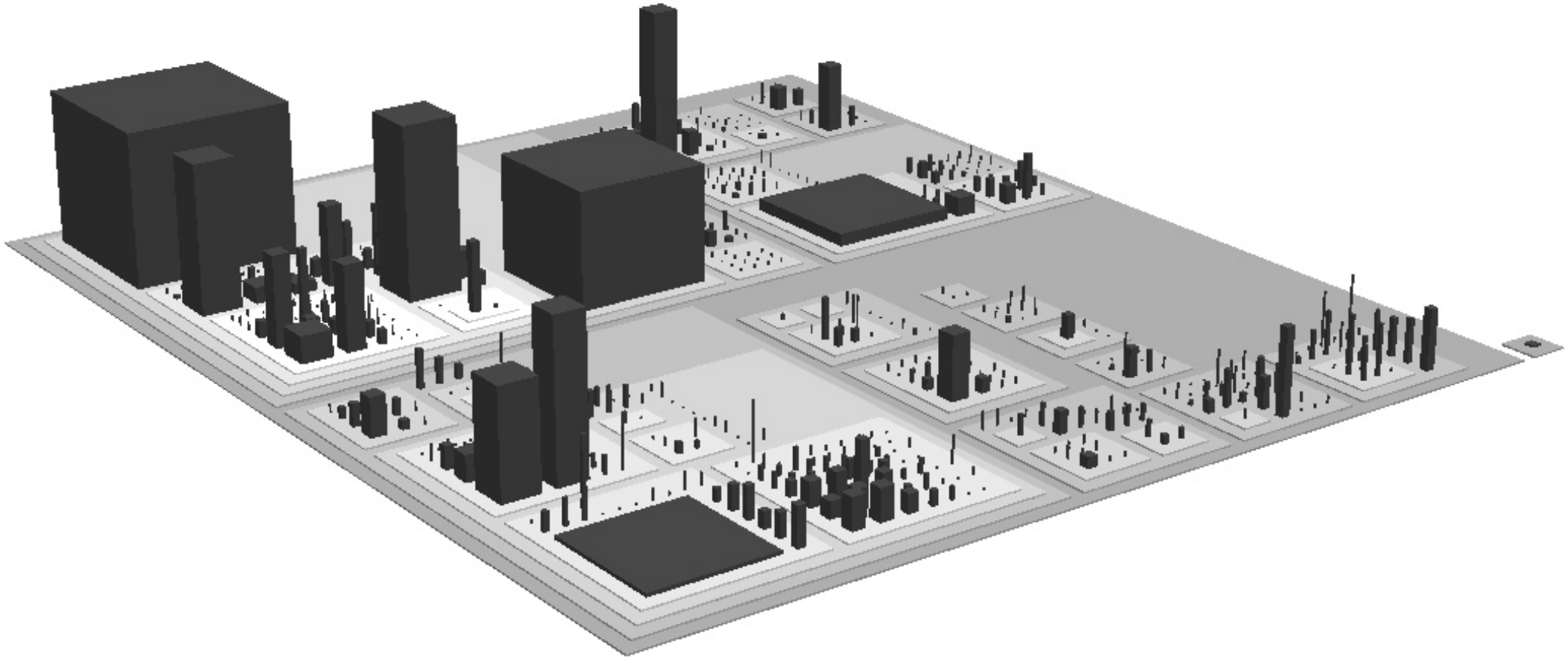


CodeCity - Beispiel

Spring.Net 1.3.1

Grundfläche: Anzahl Attribute

Höhe: Anzahl Methoden



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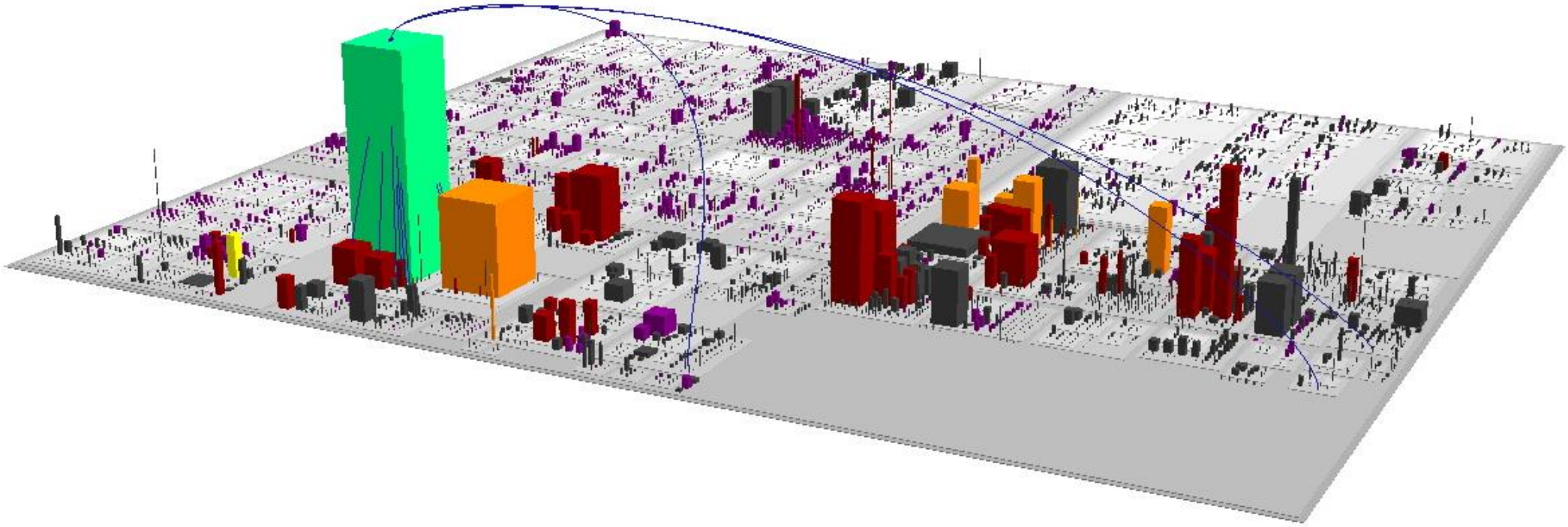
CodeCity - Vererbung



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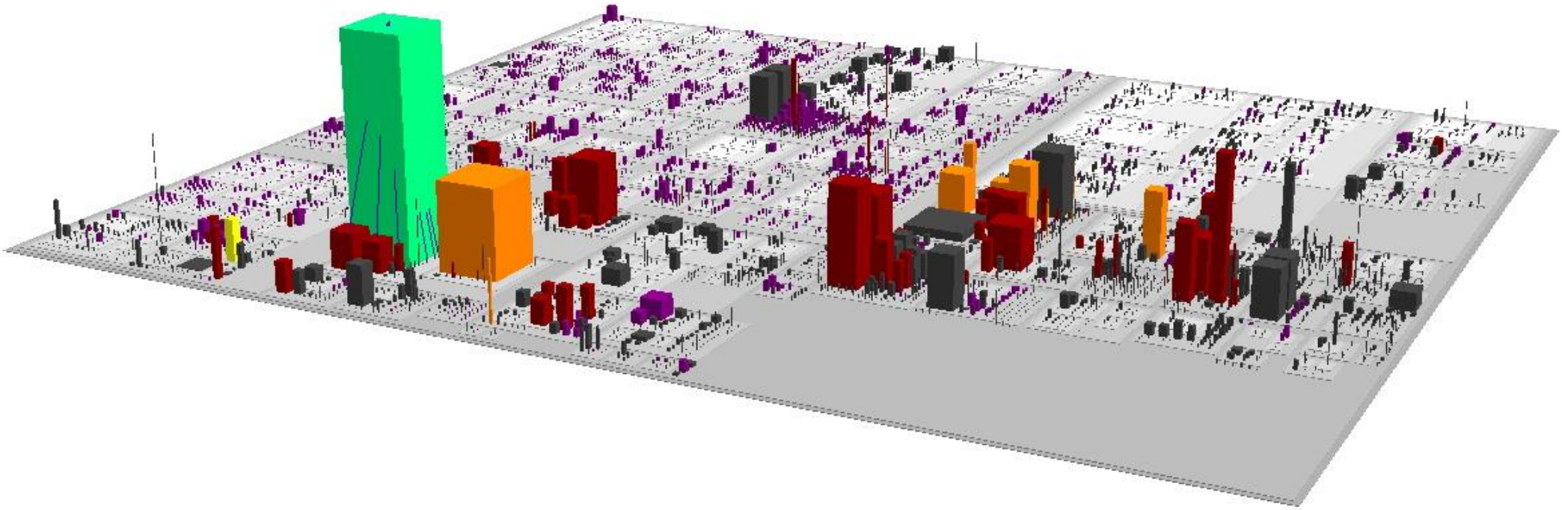
CodeCity – Afferente Beziehungen



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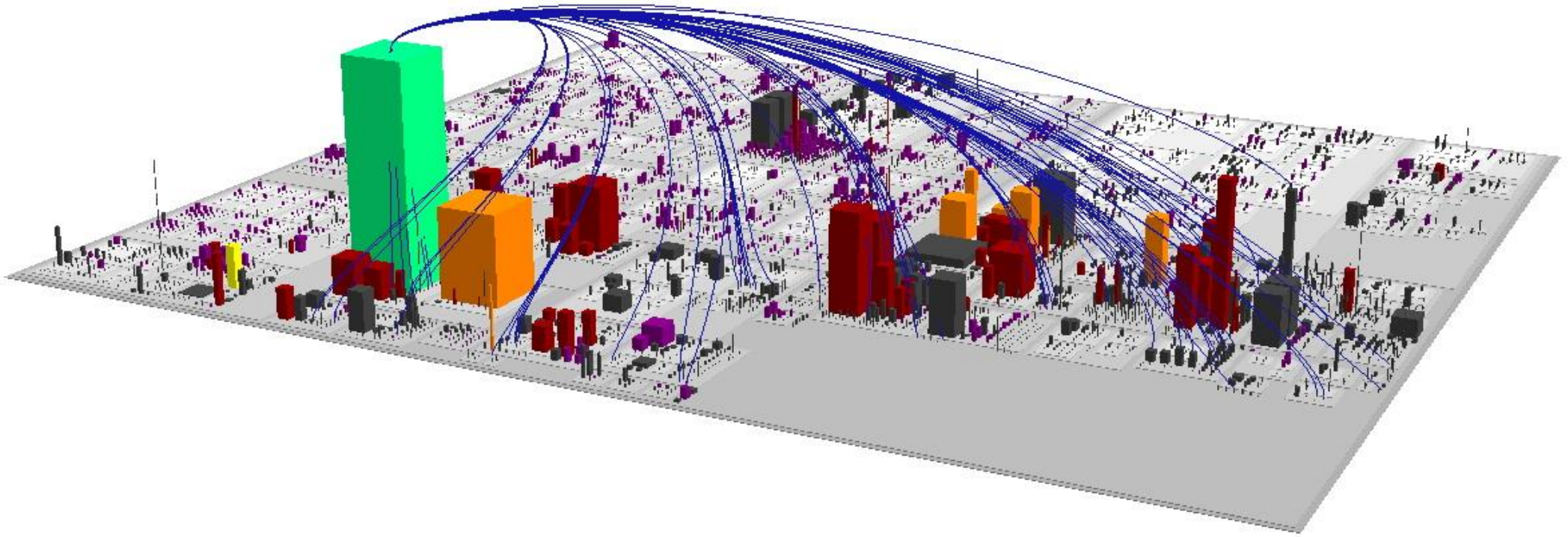
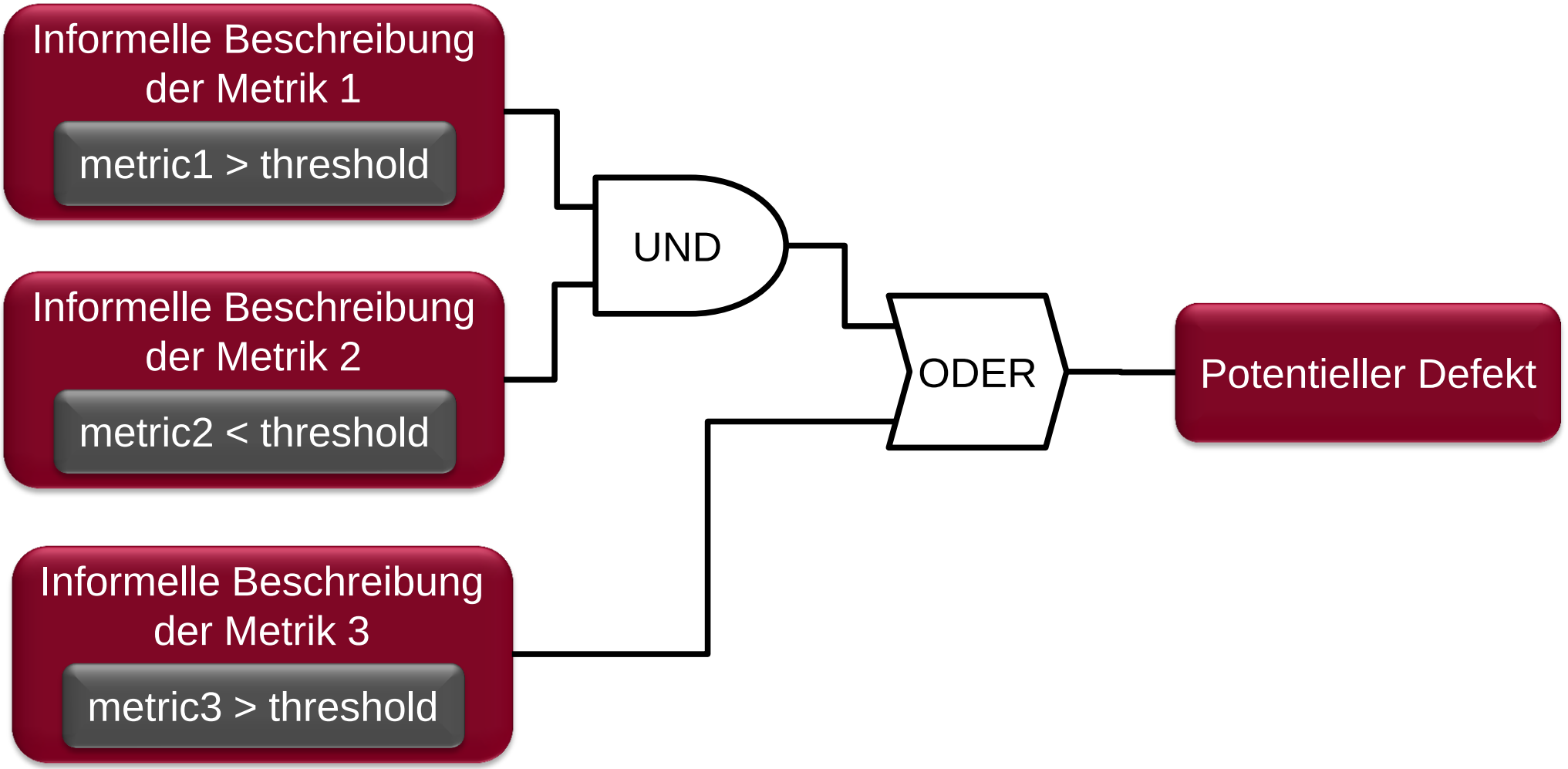
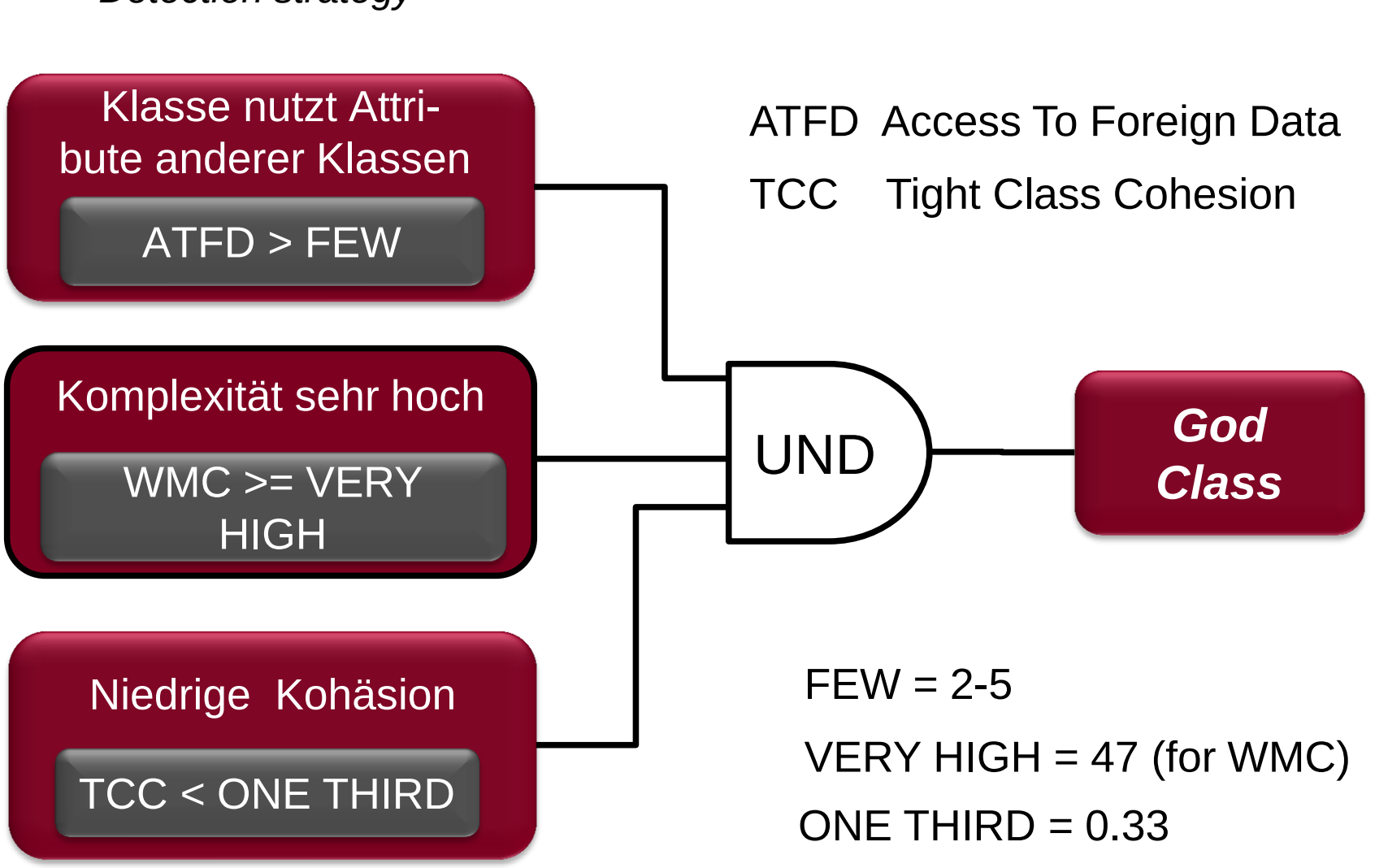


CodeCity – Design Disharmonies



CodeCity – Design Disharmonies

Detection strategy



ATFD Access To Foreign Data

TCC Tight Class Cohesion

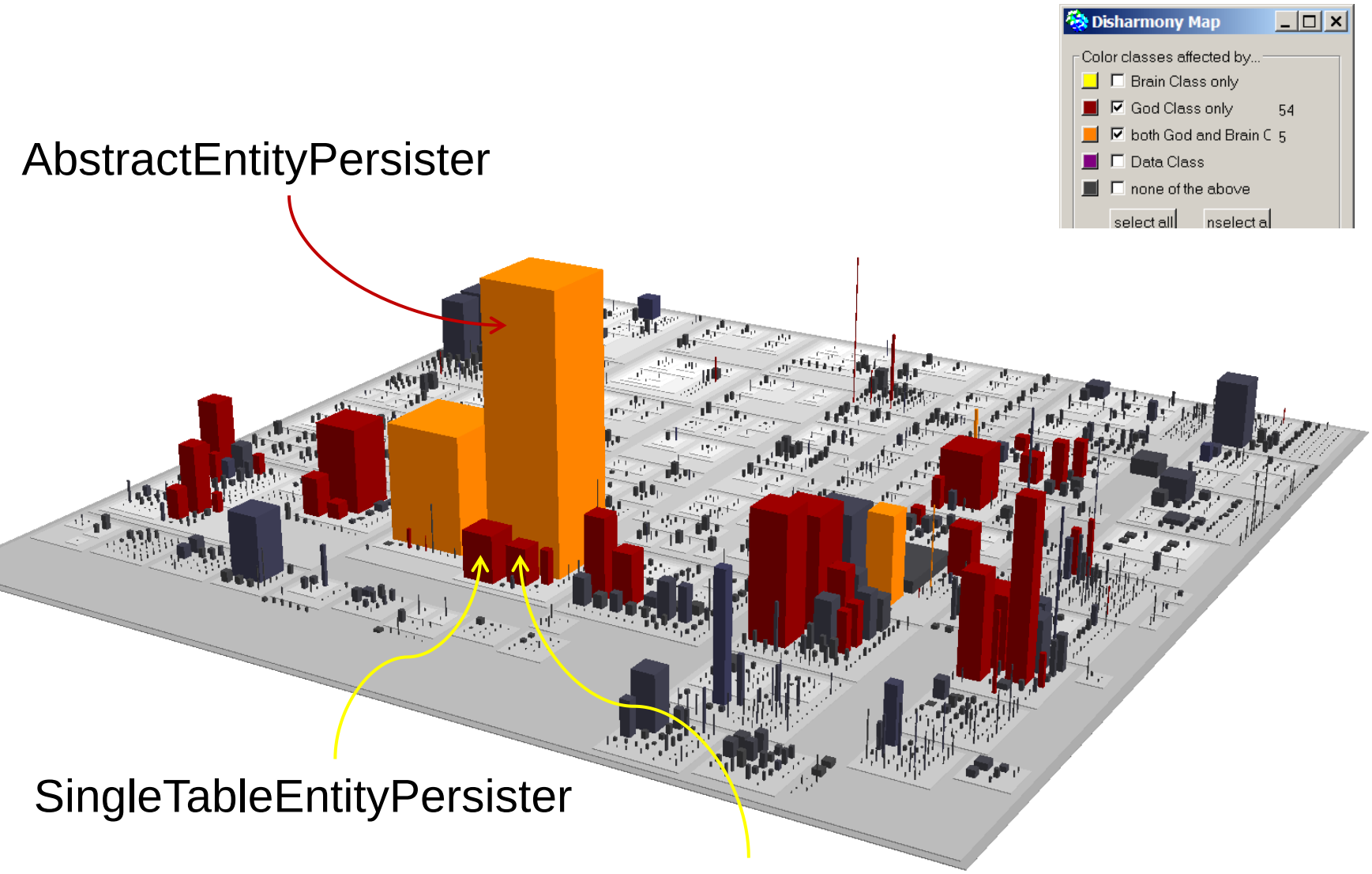
identity disharmony

FEW = 2-5

VERY HIGH = 47 (for WMC)

ONE THIRD = 0.33

CodeCity – Design Disharmonies



identity disharmony

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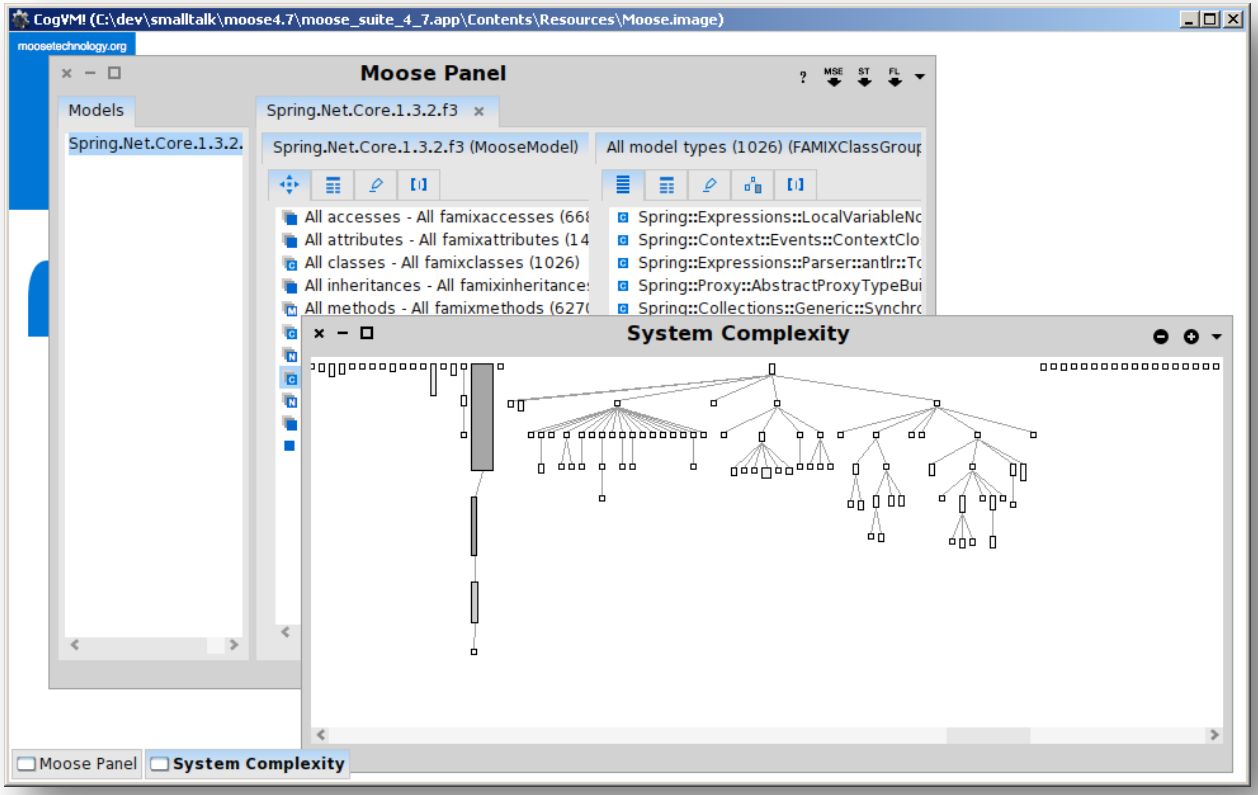
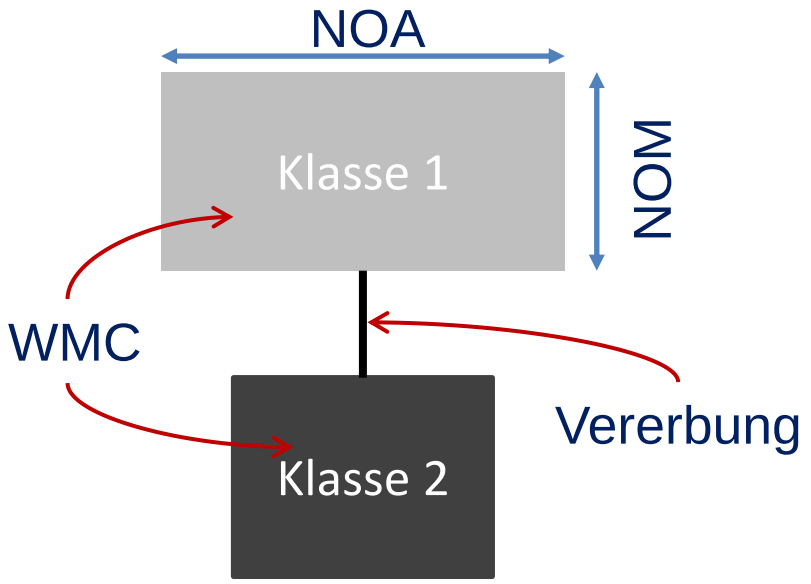
Moose

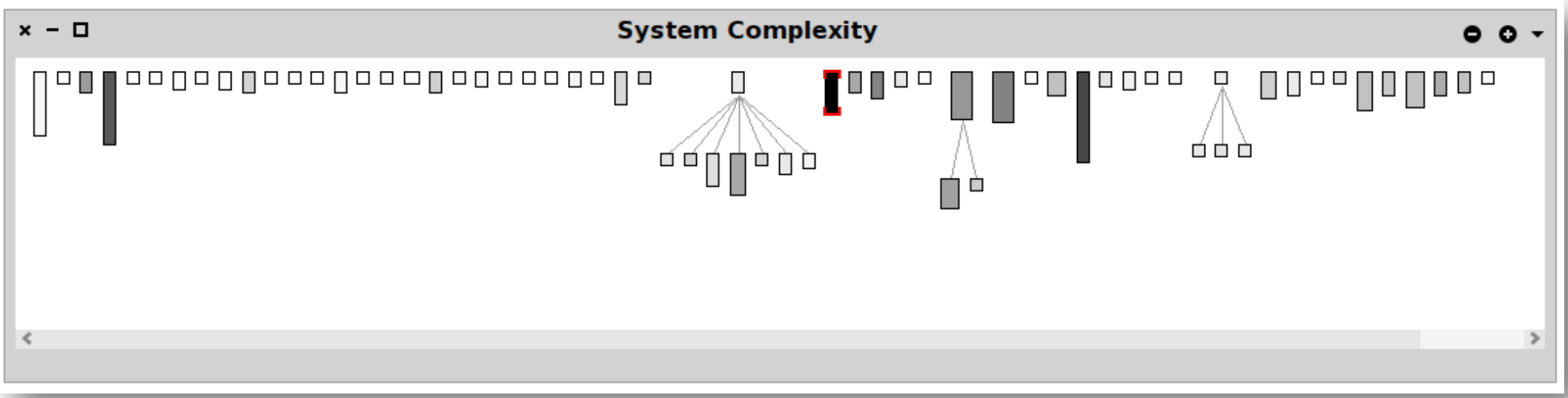
- Visualisierungs-Plattform (für Code)
- Aktuelle Version 4.7
- http://www.moosetechnology.org
- Kommerzielle Nutzung möglich



Moose – System Complexity View

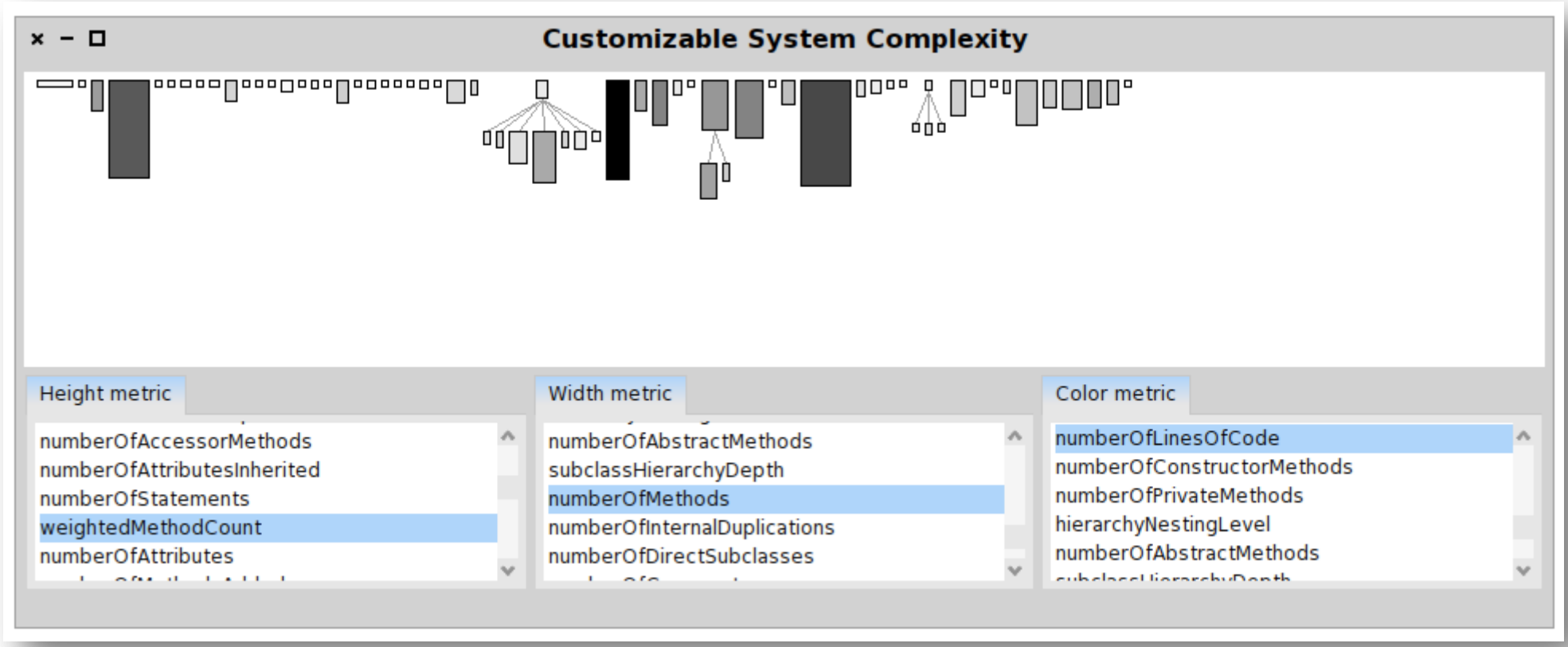
- *System Complexity View*





Moose – System Complexity View

- Frei-konfigurierbarer *System Complexity View*

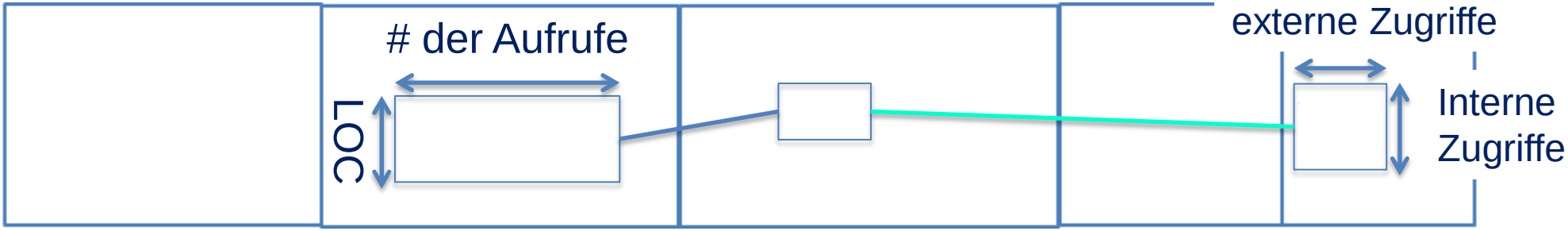


Moose – Class Blueprint

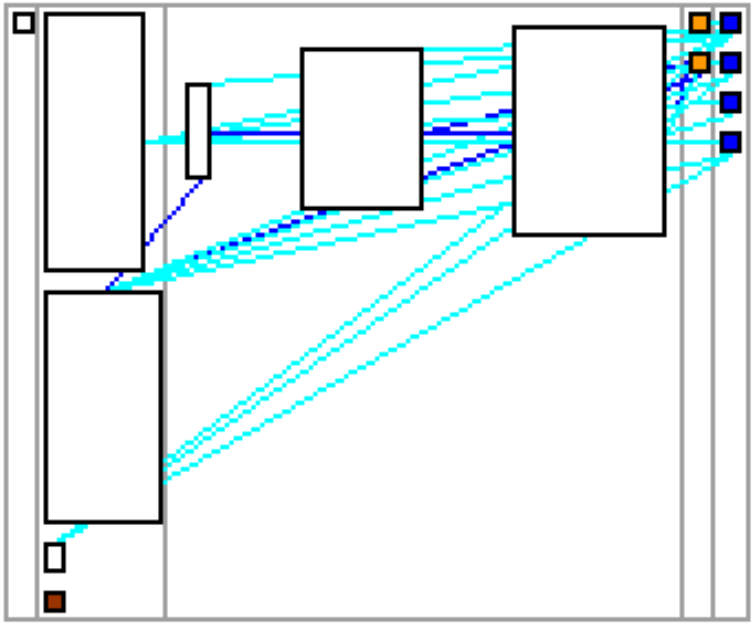
- Ermöglicht die Analyse des Klassendesigns
- Versucht den Programmablauf in einer Klasse zu visualisieren

- Öffentlichkeit nimmt von links nach rechts ab.

Moose – Class Blueprint Beispiel

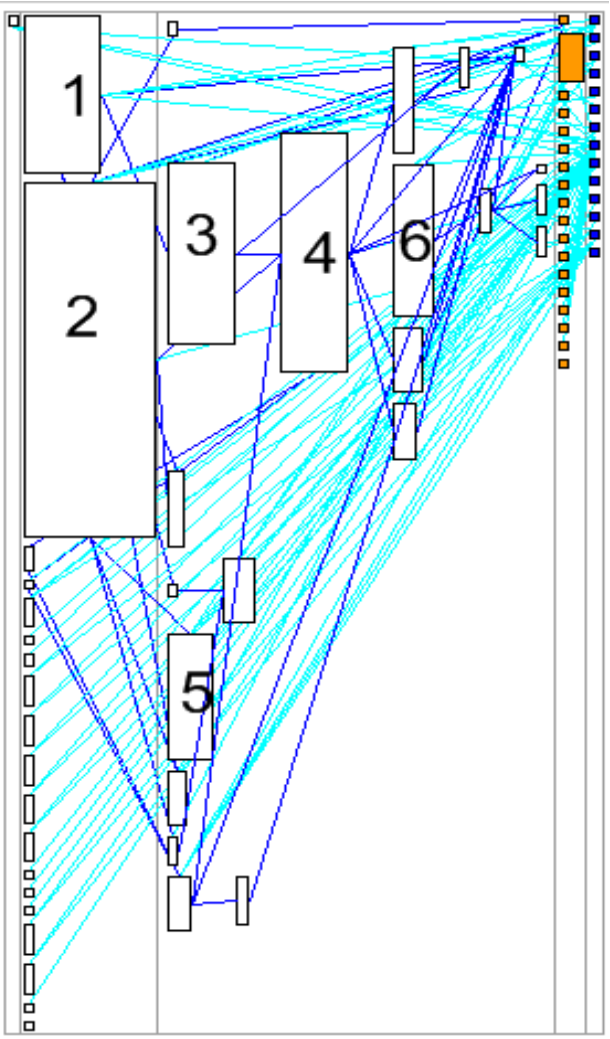


- Beispiel



Moose – Class Blueprint

EjbConfiguration (Brain Methoden)



- Methoden 1-6 sind sehr groß
- Markierte Methoden greifen auf viele Attribute der Klasse zu
- Markierte Methoden sind *Brain Methods* :
  - Line of Code (LOC) > 65
  - zyklomatische Komplexität > 3
  - Verschachtelungstiefe > 3
  - Verwendet mehr als 7-8 Attribute

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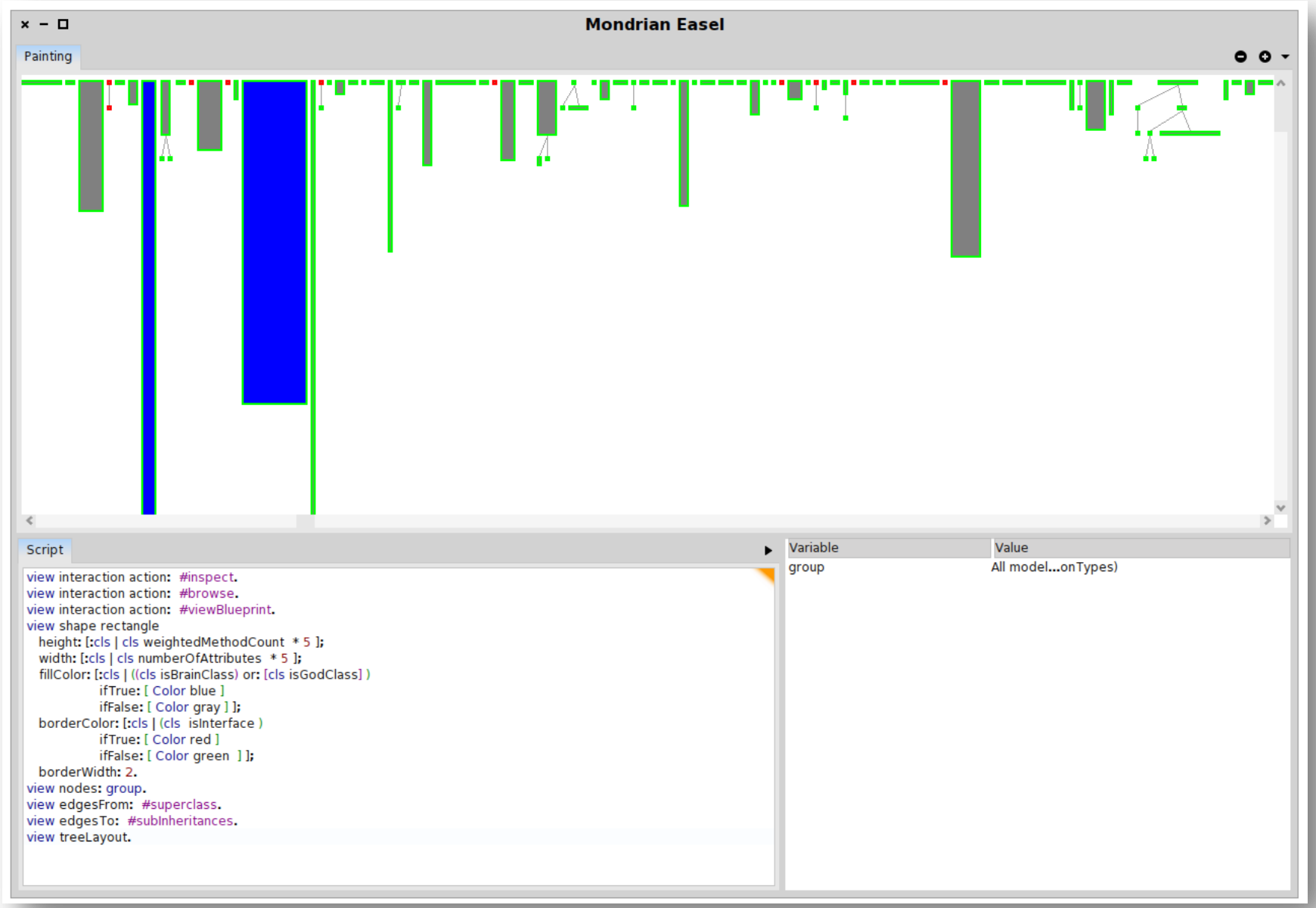
Moose – eigenes Easel



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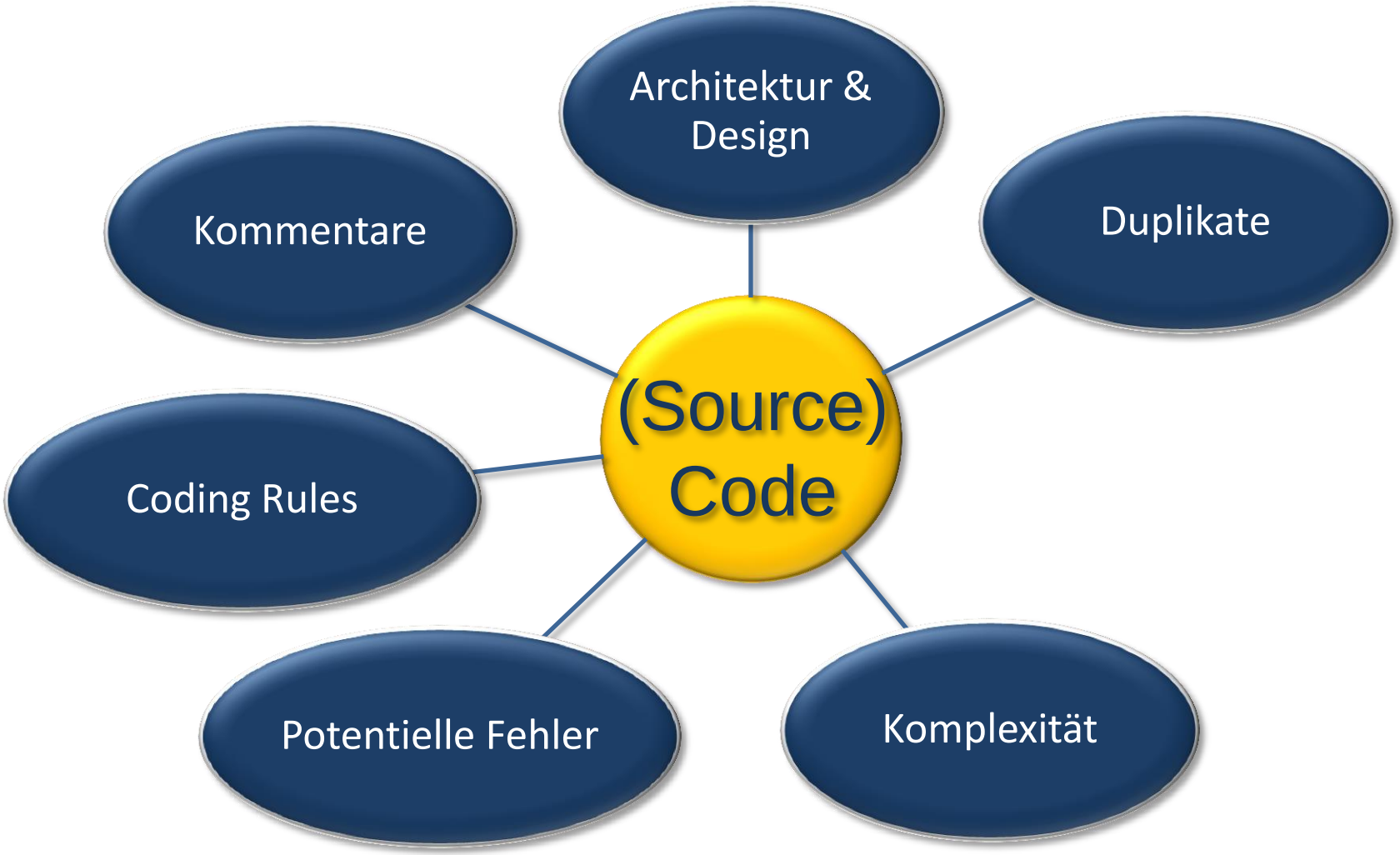
„Hybridmodelle“ und Visualisierung



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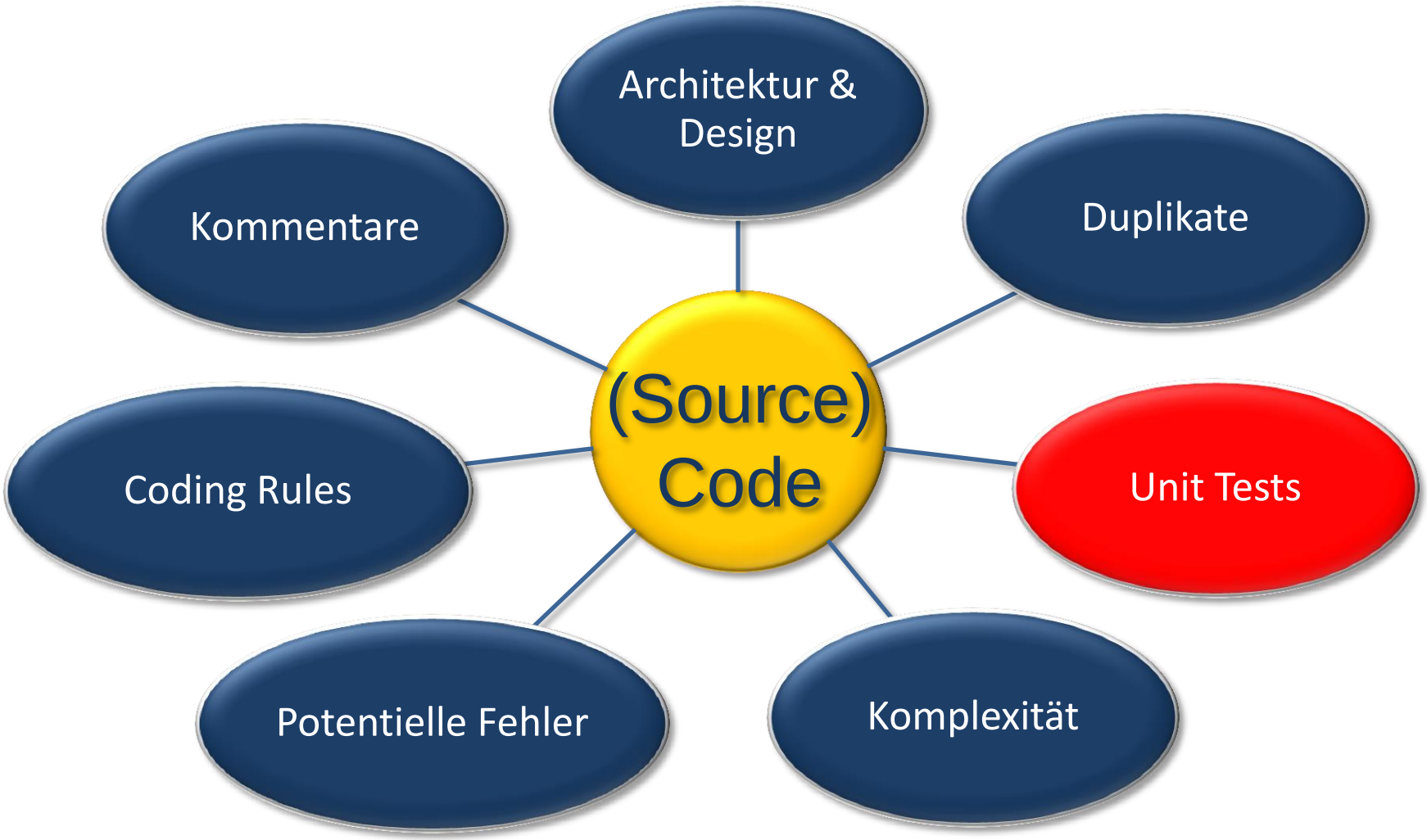
„Hybridmodelle“ und Visualisierung



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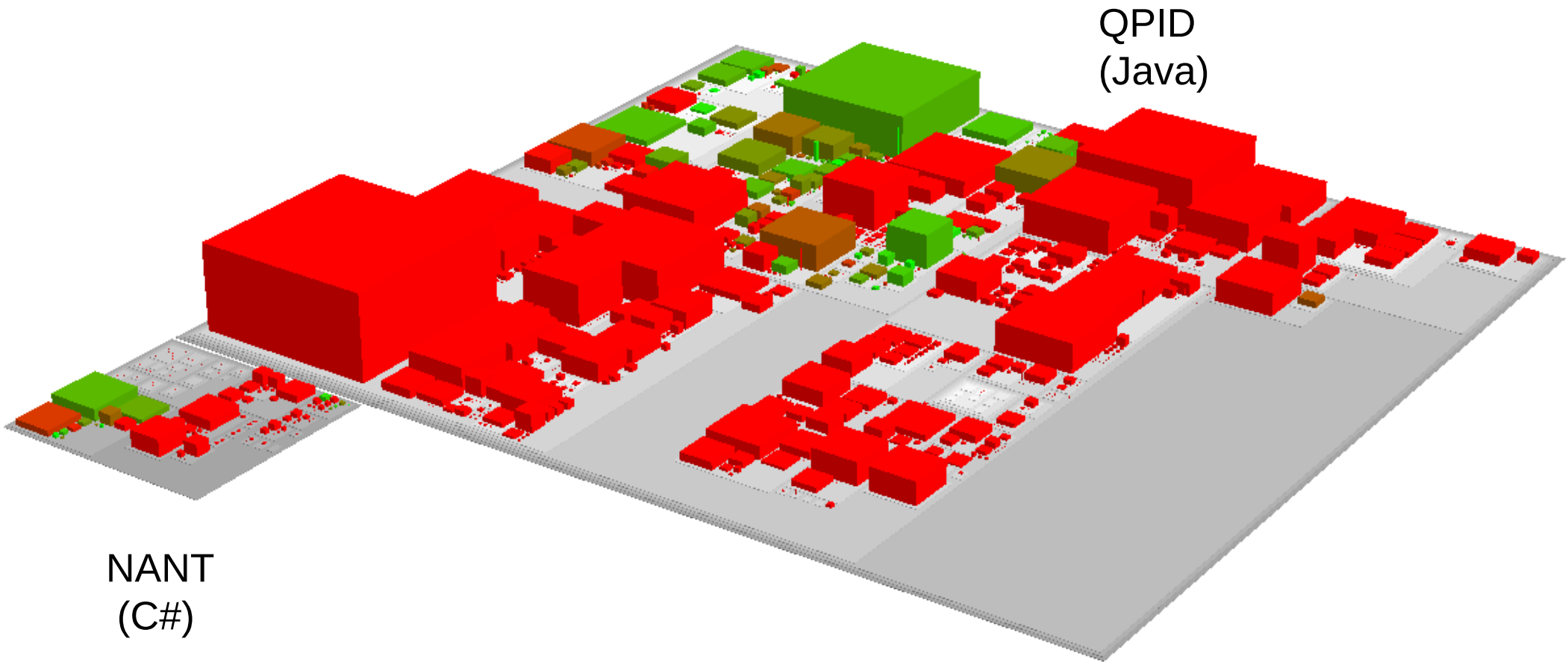
Heterogenes Modell mit CodeCoverage



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Zusammenfassung

- Grafische Darstellung von Metriken kann helfen
  - die Strukturierung zu verstehen
  - die “hot-spots” des Systems zu identifizieren (Polymetric Views / TreeMaps / Städte-Metapher)
- Die vorgestellten Werkzeuge haben alle ihre Vor- und Nachteile
- Weiterführende Analyse des Codes sollte dann „manuell“ erfolgen

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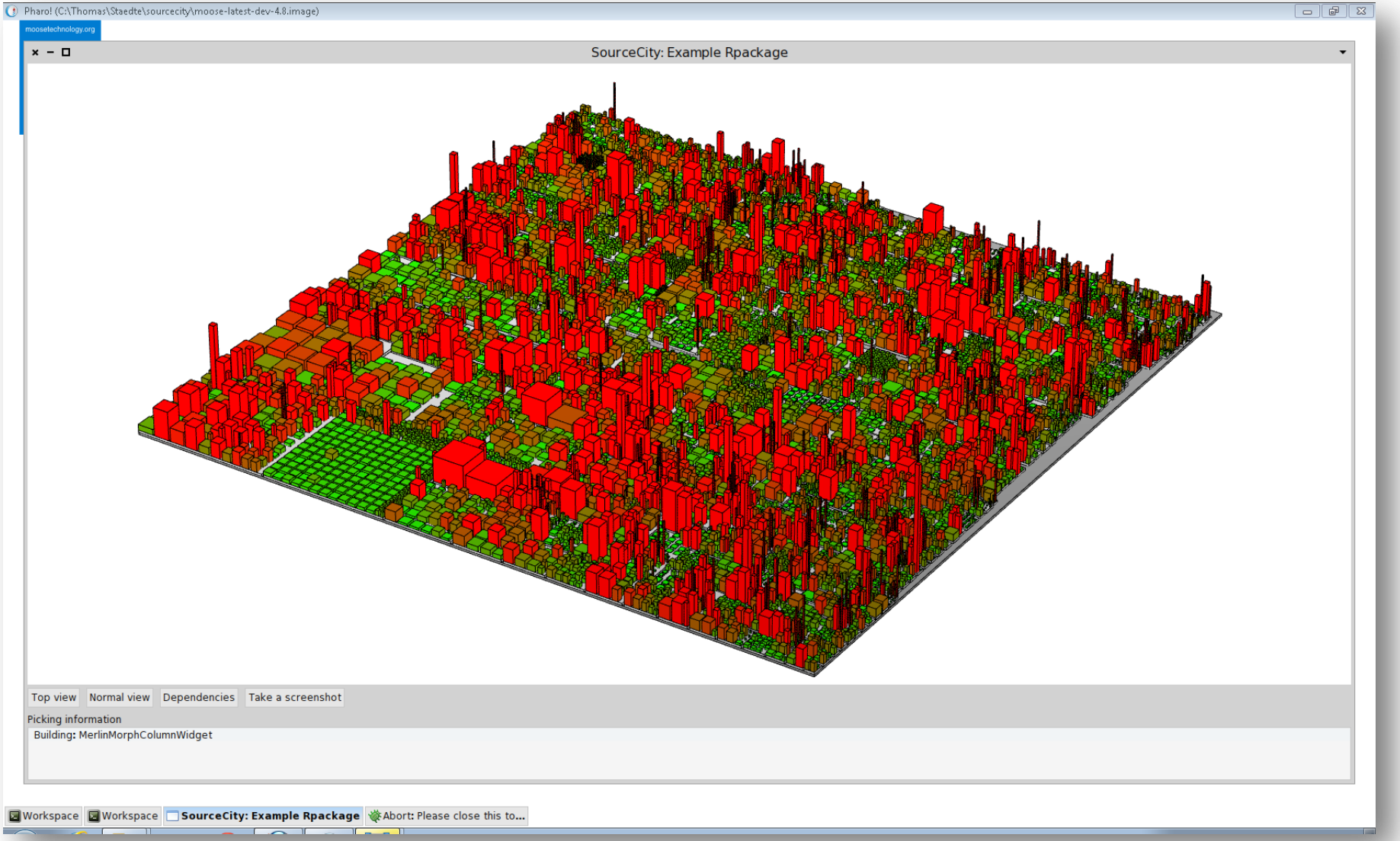
Alternativen 1: SourceCity



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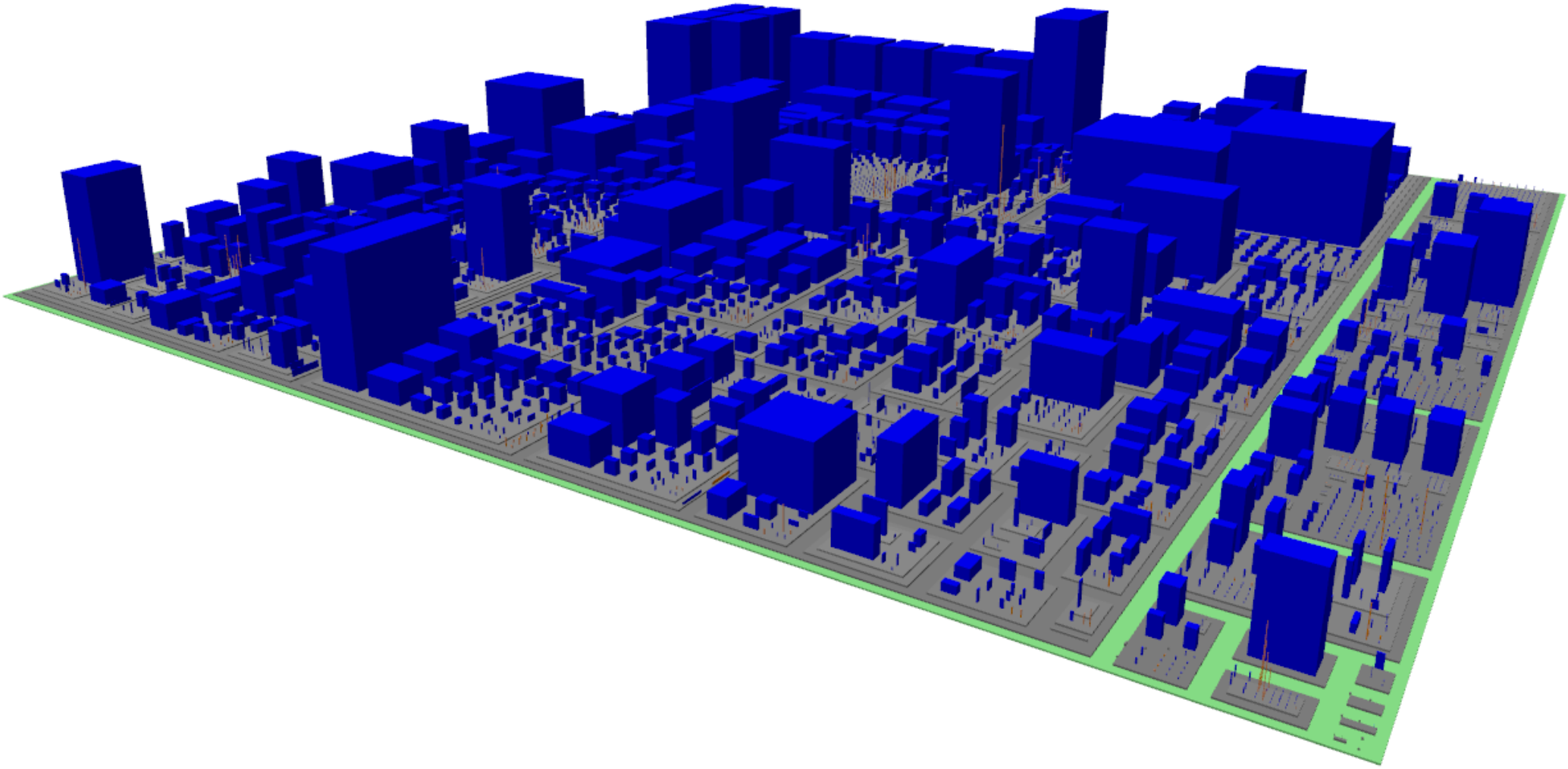
Alternativen 2: SharpCity



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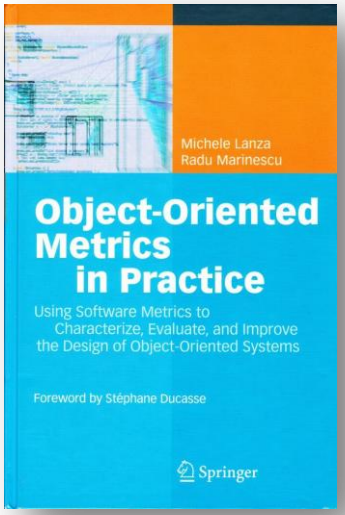
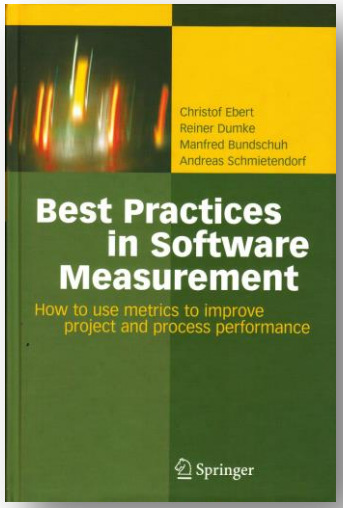
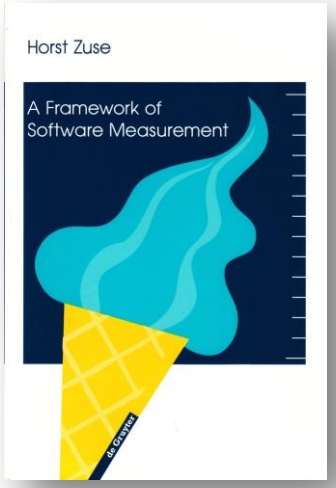
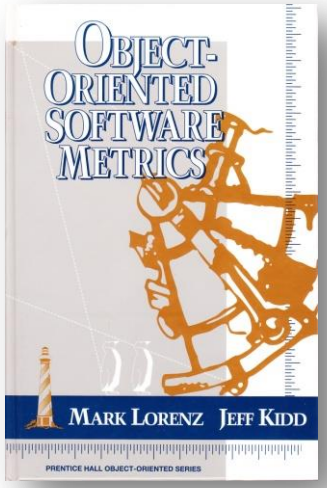
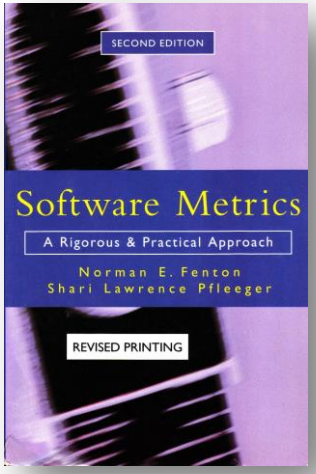
Literatur

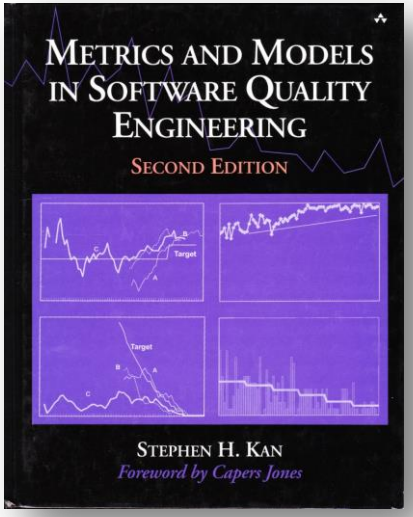


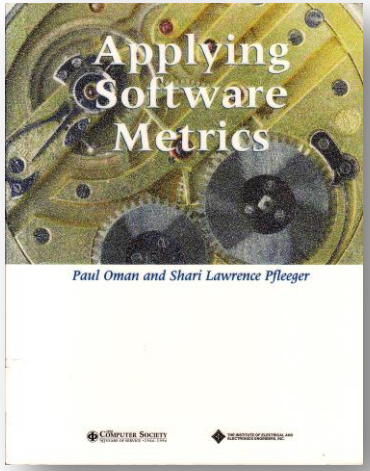


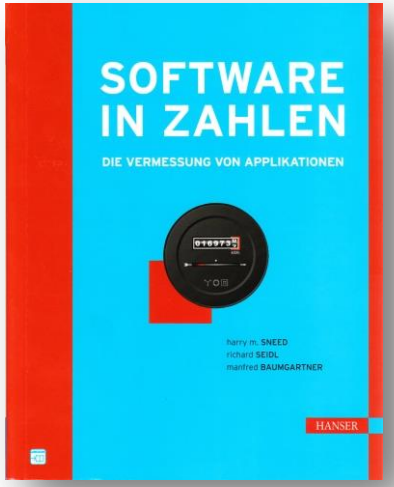












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Literatur

- ckjm http://www.spinellis.gr/sw/ckjm/
- PMD http://pmd.sourceforge.net/
- IPlasma http://loose.upt.ro/iplasma/index.html
- InFushion http://www.intooitus.com
- InCode http://loose.upt.ro/incode/pmwiki.php/Main/Incode?from=Main.InCode
- CodeCity http://www.inf.unisi.ch/phd/wettel/codecity.html
- Moose http://www.moosetechnology.org
- xRadar http://xradar.sourceforge.net
- SonarJ http://www.hello2morrow.com/products/sonarj
- Sonar http://www.sonarsource.org

- SharpMetrics http://www.sharpmetrics.net

Vielen Dank

Fragen?

$$MI = 171 - 5{,}2 * l(average(V)) - 0{,}23 * averageV(g') - 16{,}2 * \ln(average(LOC)) + 50 * \sin\left(\sqrt{(2{,}4 * PerCM)}\right)$$

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@tshaug

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Durchhänger?

Eine kleine Stärkung gibt es jetzt am MATHEMA-Stand!