LORE
Lab On Reengineering
Dept. of Mathematics - Computer Science
University of Antwerp - Belgium
http://www.lore.ua.ac.be/
Research Spectrum

**IWT – Basic Research**
- Research grants (pre-doc, post-doc)
- SBO, GBOU, ...

**FWO**
- Research grants (pre-doc)
- Research projects

**IWT – R & D**
- Industrial Research SME program!
- Eureka (European)
- ...

**Industrial R & D**
- Direct sponsoring

**FUNDAMENTAL**

**APPLIED**
Research Spectrum

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“In vivo” Research

Fundamental

Applied
Components are very brittle ... 
After a while one inevitably resorts to glue :)
Research Theme
Who Are We?

**LORE**
- Matthias Rieger (Code Duplication)
- Bart Van Rompaey (Testing)
- Bart Du Bois (Quality Driven Refactoring)
- Joris Van Geet (migration to SOA)
- Filip Van Rysselberghe (mining repositories)

**FOTS**
- Anne Keller
  - MDA/MDE
- Pieter Van Gorp
- Hans Schippers
- Olaf Mulliawan
- Niels Van Eetvelde (formal models for refactoring)

Serge Demeyer (Prof.)

Dirk Janssens (Prof.)
Split Up God Class: 5 variants

Mail client filters incoming mail

A. Controller
   Extract behavioral class

B. Controller
   Extract data class

C. Controller
   MailHeader
   Extract behavioral class

D. Controller
   MailHeader
   Filter1
   Filter2
   Extract behavioral class

E. Controller
   FilterAction
   Filter1
   Filter2
   NameValuePair
   MailHeader
   Extract data class
Empirical Validation

- **Controlled experiment** with 63 last-year master-level students (CS and ICT)
### Key Concept Identification

- Extract run-time coupling
- Apply datamining ("google")
- Experiment with documented open-source cases (Ant, JMeter)
  - recall: +- 90 %
  - precision: +- 60 %

<table>
<thead>
<tr>
<th>Class</th>
<th>IC CC + web-mining</th>
<th>Ant docs</th>
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</tr>
<tr>
<td>TaskContainer</td>
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</tr>
</tbody>
</table>

| Recall (%) | 90   | -   |
| Precision (%) | 60   | -   |
Analyse CVS changes

1) Vertical lines = Frequent Changers

2) Horizontal line = Shotgun Surgery

3) Triangle = Core Reduces

4) Block Shift = Design Change
WP2: Model Analysis

- Mining software repositories (CVS, SVN,...)
  - UA-AdREM (...)

- Refactoring feature models
  - FUNDP (Heymans & Schobbens)

- State-machines in practice INDUSTRIAL PROJECT
  - UCL (Charles Pecheur)
  - ULB (Jean-François Raskin)

WP4: Co-evolution

- Anne Keller: a meta-model for (in)consistencies
  - VUB-SSEL (Ragnhild Van Der Straeten)

- Tool-infrastructure for co-evolution (intensional view style)
  - UCL (Kim Mens)

- Co-evolution of unit tests
  - TUDelft (Andy Zaidman)