Research at RMOD

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http://rmod.lille.inria.fr
RMOD

- Research Group at INRIA Lille
  - 4 Full (2 INRIA, 2 Professors)
  - 2 Engineers, 1 Postdoc, 3 PhD

- Collaboration with
  - Ecole de Mines Douai (2 PhD)
  - VUB Brussels (1 PhD)
  - PLEIAD Chile (1 Postdoc)
Software Evolution
Old View

- Software is developed
- We ship the product
- That’s it.
This is Wrong!

- The fun starts after shipping
- Maintenance costs more
- Software lives forever

Maintain.....
Eternal Systems
How can we help developers to evolve software?
Evolving Applications

- Tools for supporting evolution
  - Code history
  - Program understanding
- Software Visualization
Language Support

- Improve **languages** to support evolution

- Nice: lots of topics fit
  - Modularity,
  - Reflection,
  - .....
Going Meta...

- How to evolve the languages itself?
- Can we improve self-evolution support?
Examples
Applications
Platform for Software and Data Analysis

- Implemented in Smalltalk
  - VisualWorks (until 2008)
  - Pharo since
- http://moosetechnology.org/
Moose

Analysis

Pharo
Language Support
Code Model Infrastructure

- Able to query all the versions
- What were the senders of this method in version 13168?
- What is the diff between the senders in the past and the one now?
- Support for merging
- Distributed source code

(Veronica Uquillaz-Gomez)
The Consistency Problem

- Current languages require one globally consistent world
- We can not evolve parts independently
- Example: Library versions
Object Spaces

- Virtualize the concept of the image
- Whole systems as an Objects
- Run Pharo 2.2 in Pharo 2.6  
  (Gwenaël Casaccio)
Enables lots of Experiments

- Modularization
- Security
- Distribution
- Concurrency
- ...

...
Handles

- Take the Reference POV
- How can we change behavior and state per Reference?
- Examples
  - Read-Only Execution
  - Transactions

(Jean-Baptiste Arnaud)
Embedded Systems

- How to evolve embedded programs?
  - implemented in static languages (C)
  - Headless
  - No resources

- Remote Reflection, Marea  
  (Mariano Martinez Peck, Nick Papoulias)
Evolve Languages
Bootstrapping Smalltalk

- Yesterday: Talk at Workshop about Bootstrap
- Allows for evolving the languages Kernel
- Run experimental kernel for experiments
  - (Benjamin van Ryseghem, Gwenael Casaccio)
Evolving VMs...

- The current VM is fast but complex
  - (like all real world systems)

- For Students and Research we need to think about something simpler

- Future Work
  (Camillo Bruni, Javier Pimás, Guido Chari)
Questions?