

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.



Develop

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,
 - ✦

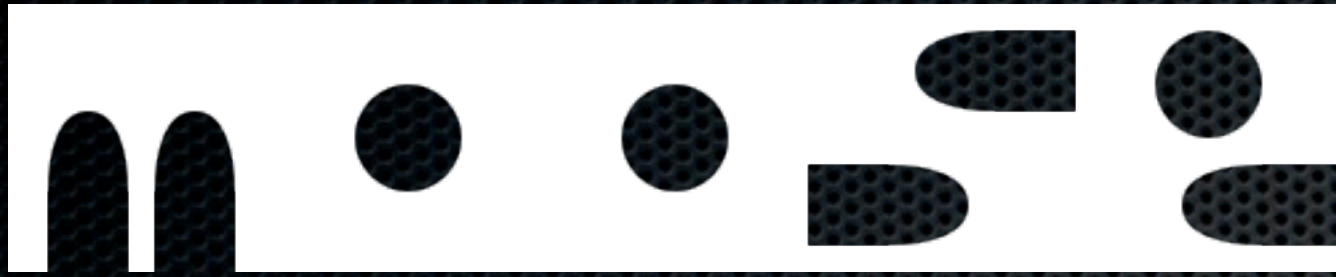
Going Meta...

- ✦ How to evolve the languages itself?
- ✦ Can we improve self-evolution support?



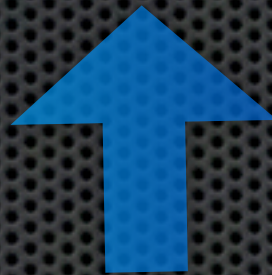
Examples

Applications



- ✧ Platform for Software and Data Analysis
- ✧ Implemented in Smalltalk
 - ✧ VisualWorks (until 2008)
 - ✧ Pharo since
- ✧ <http://moosetechnology.org/>

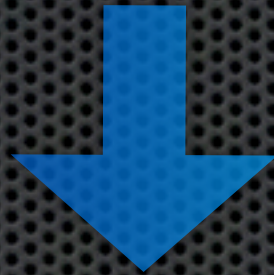
Moose



Build on

Pharo

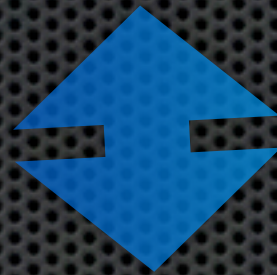
Moose



Analysis

Pharo

Moose



Feedback Loop

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

(Gwenael 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?