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Hackathon

on

Reverse Engineering and Reengineering

Summer School on **Software Technologies** and **Software Languages**
Vadim Zaytsev, SWAT, CWI

 **2012**

SoTeSoLa

Software Technologies
and Software Languages

SoTeSoLa: Software Technologies

- Modeling: UML, EMF, QVT, AM3, ...
- Mapping:
ODB, Hibernate, JAXB, JiBX, XStream, JSON, YAML, ...
- Graphics: Tk, GTK+, SWT, AWT, Swing, ...
- Build automation: Ant, make, rake, ...
- Web programming: GWT, ASP, JBoss, ...
- ...

SoTe**SoLa**: Software Languages

- Java, C # , Scala, Groovy
- Haskell, Hugs, Ωmega, Helium, Gofer
- COBOL and its 700 dialects
- Python, Ruby, Perl, awk, sed
- JavaScript, CoffeeScript, Dart, Mobl, Kaffeine
- LISP, CLOS, Scheme, Clojure
- ML, F # , OCaml

Software Chrestomathies

- **Rosetta Code**

- 450 programming tasks
- 351 programming languages

- **101 companies**

- 1 problem domain
- 131 implementations
- 43 software languages
- 82 software technologies

Hackathon objective

- Exercise methods and tools for

- reverse engineering
- reengineering

- Apply them to

- 101 companies repo

- Expectation:

- produce a corpus of samples for teaching

ANTLR

Python MPS

Rascal


Magnolia

Ensō Moose

Ekeko

Hackathon rules

- Register at <http://planet-sl.org/sotesola2012-hackathon>
- Hangouts + Skype sessions + on-site sessions
- Propose your problem
- Develop your solution
- Commit the code to GitHub
(unless another infrastructure is crucial)
- Win the prize
- Utilise the prize



we help you

Hackathon details

- Form a team of 3 (three) participants
- Bring your favourite methods & tools
- Work on 101 companies chrestomathy
- Think of a problem
- Choose the appropriate subset of implementations
- Hack!



Reverse Engineering

Fact extraction

- Lines of source code & other size metrics
- Cyclomatic complexity
- Software science
- Maintainability index
- Dead code detection
- ...

Software visualisation

- Control flow graph
- Data flow graph
- Metrics visualisation
- Relation visualisation
- ...

Vocabulary mining

- Naming analysis
- Verb & noun analysis
- Word clouds
- Ontology verification
- ...

Analysis of technology usage

- How extensively the language is used?
- What features of a technology are the most used ones?
- Which functionality is never used?
- What is the API usage coverage?
- ...

Architecture recovery

- Model-driven context of reverse engineering
- Model extraction
- Data model inference
- Grammar inference & recovery
- Design pattern recovery
- ...



Reengineering

http://commons.wikimedia.org/wiki/File:Grus_grus_-migrating_north-6a.jpg

Program refactoring

- Apply known refactorings to existing solutions
- Make it so that it doesn't break
- Dead code elimination
- API migration
- ...

Migration

- API migration
- Language migration
- Framework migration
- Platform migration
- Wrapping
- ...

Code injection

- Assertions
- Logging
- Aspect weaving
- Feature composition
- ...

Architectural modifications

- API improvement based on its current usage
- Database re-engineering
- Modularization or component identification
- Coupled software transformations
- Legacy system renovation
- ...

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<http://planet-sl.org/sotesola2012-hackathon>

This page describes the hackathon, but the discussions and activities take place within the group "[SoTeSoLa Hackathon](http://planet-sl.org/community)" on planet-sl.org/community

context

Objective

Prerequisite

Deliverables

Resources

Logistics

Award

Coordination

- [Software Mining](#) @ Wikipedia
- [Reverse engineering](#) @ Wikipedia
- [Re-engineering](#) @ Wikipedia
- [Simple illustrative implementations](#) @ github.com/SoTeSoLa
- More illustrative implementations elsewhere:
 - [loc101demo](#)
 - [api101demo](#)
 - [coupling101demo](#)
- 101companies:
 - [101repo](#)
 - [101wiki](#)
 - [101data](#)
 - [meta-level 101features](#)
- Conferences @ DBLP:
 - Reverse engineering: [WCRE](#), [ICPC](#), [MSR](#), ...
 - Re-engineering: [ICSM](#), [CSMR](#), ...

Let's hack!

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