

Spooofax vs Xtext

A language workbench comparative case study

University of Antwerp

Leonard Elezi

leonard.elezi@student.uantwerpen.be

*Ingredients of a DSL:

1. Parser
2. Semantic analysis
3. Transformations
4. Code generator
5. Integration to an IDE



What is a language workbench?

A tool that supports DSL creation not just in terms of parsing and code generation but also in providing a better editing experience for DSL users.*



* M. Fowler. Language workbenches: The killer-app for domain specific languages <http://martinfowler.com/articles/languageWorkbench.html>, 2005

Spoofax

- On top of Eclipse
- Text based approach to building DSLs
- SDF to define grammars
- Stratego transformation language
- Editor language

Package Explorer

- editor
 - EntityLang-Builders.esv
 - EntityLang-Builders.genera
 - EntityLang-Colorer.esv
 - EntityLang-Colorer.genera
 - EntityLang-Folding.esv
 - EntityLang-Folding.genera
 - EntityLang-Outliner.esv
 - EntityLang-Outliner.genera
 - EntityLang-References.esv
 - EntityLang-References.gen
 - EntityLang-Syntax.esv
 - EntityLang-Syntax.genera
 - EntityLang.main.esv
- include
- lib
- META-INF
- syntax
 - Common.sdf
 - EntityLang.sdf
- test
 - example.ent
- trans
 - check.str
 - entitylang.str
 - generate.str
- utils
 - .classpath
 - .project
 - build.generated.xml
 - build.main.xml
 - build.properties

entitylang.str EntityLang.main.esv EntityLang.sdf example.ent

```
i module example
// Example "EntityLang" program (see syntax/EntityLang.sdf for the
entity User {
    name      : String
    password  : String
    homepage  : URL
}
entity BlogPosting {
    poster    : User
    body      : String
}
entity URL {
    location  : String
}
```

Xtext

- Also built on Eclipse
- Tight integration with EMF
- Xtend for code generation
- Java for constraint checking

Java - org.xtext.example.mydsl/src/org/xtext/example/mydsl/MyDsl.xtext - Eclipse - /Xtext-tutorial

Quick Access

Package Explorer

- org.xtext.example.mydsl
 - src
 - org.xtext.example.mydsl
 - GenerateMyDsl.mwe2
 - MyDsl.xtext
 - src-gen
 - xtend-gen
 - JRE System Library [J2SE-1.5]
 - Plug-in Dependencies
 - META-INF
 - build.properties
 - org.xtext.example.mydsl.sdk
 - org.xtext.example.mydsl.tests
 - org.xtext.example.mydsl.ui

MyDsl.xtext

```

grammar org.xtext.example.mydsl.MyDsl with org.eclipse.xtext.common.Terminals;

generate myDsl "http://www.xtext.org/example/mydsl/MyDsl";

Model:
    greetings+=Greeting*;

Greeting:
    'Hello' name=ID '!';
  
```

Outline

- grammar org.xtext.examp
 - generate myDsl
 - Model
 - Greeting

Problems @ Javadoc Declaration

0 errors, 5 warnings, 0 others

Description	Resource	Path	Location	Type
▶ ⚠ Warnings (5 items)				

Writable | Insert | 2 : 1

Reading Material

- The Spoofox Language Workbench Rules for Declarative Specification of Languages and IDEs, Lennart C. L. Kats, Eelco Visser
- Stratego: A Language for Program Transformation based on Rewriting Strategies System Description of Stratego 0.5, Eelco Visser
- A Comparison of Tool Support for Textual Domain-Specific Languages, Michael Pfeier, Josef Pichler
- Comparing Language Workbenches, Roman Stoffel
- <http://strategoxt.org/Spoofox>
- <http://www.eclipse.org/Xtext/index.html>
- <http://www.languageworkbenches.net>

Remaining work

- Determine comparison criteria
- Create and define a small DSL language to have a fair amount of results for the comparison
- Develop the DSL in the respective tools and write a paper on the process and results

