



als Plugin für Protégé

188.387

Semi-automatic Information  
and Knowledge Engineering  
VU2

Wolfgang Jandl

0209898

# fOoM - Anwendungsarten

- Java Applikation
  - web – service
  - lokal
    - Kommandozeile
    - **Protégé plugin**

# Protégé

The screenshot displays the Protégé 3.2.1 interface for editing an ontology. The main window is titled "tourismA Protégé 3.2.1" and shows a project named "tourismA".

**Subclass Explorer:** Shows an asserted hierarchy starting with "owl:Thing" and "p1:Root". Under "p1:Root", there is a class "p1:Ding" which has several subclasses, including "p1:Zimmer".

**Class Editor:** The "For Class:" field is set to "p1:Zimmer". It shows properties for "rdfs:comment" and "rdfs:label". The "rdfs:label" property is currently set to "Zimmer".

**Console Window (Protége.exe):** Displays the following log output:

```
INFO: [TripleChangePostProcessor] Completed properties after 31 ms
INFO: [TripleChangePostProcessor] Completed named classes after 31 ms
INFO: ... Loading completed after 1578 ms
CONFIG: PROMPT: Loaded plugin ca.uvic.cs.cogz.PromptUIPlugin - CogZ
CONFIG: PROMPT: Loaded plugin edu.stanford.smi.protege.promptx.foam.FoamPlugin
- FORM Plugin for Prompt
CONFIG: PROMPT: Loaded plugin edu.stanford.smi.protege.promptx.mappingDomainPSM
- MappingDomainPSM - Store mappings using the Domain_PSM ontology
CONFIG: PROMPT: Loaded plugin edu.stanford.smi.protege.promptx.simpleMappingStorage.SimpleMappingStorage - Store mapping using a simple mapping ontology
CONFIG: PROMPT: Loaded plugin edu.stanford.smi.protege.promptx.synonyms.SynonymPlugin - Lexical matching with synonyms
CONFIG: PROMPT: Loaded plugin edu.stanford.smi.protege.promptx.umls.UMLSPlugin
- Using UMLS concept identifiers for matching
INFO: Prompt version 3.0
INFO: Prompt version date: August 8, 2006

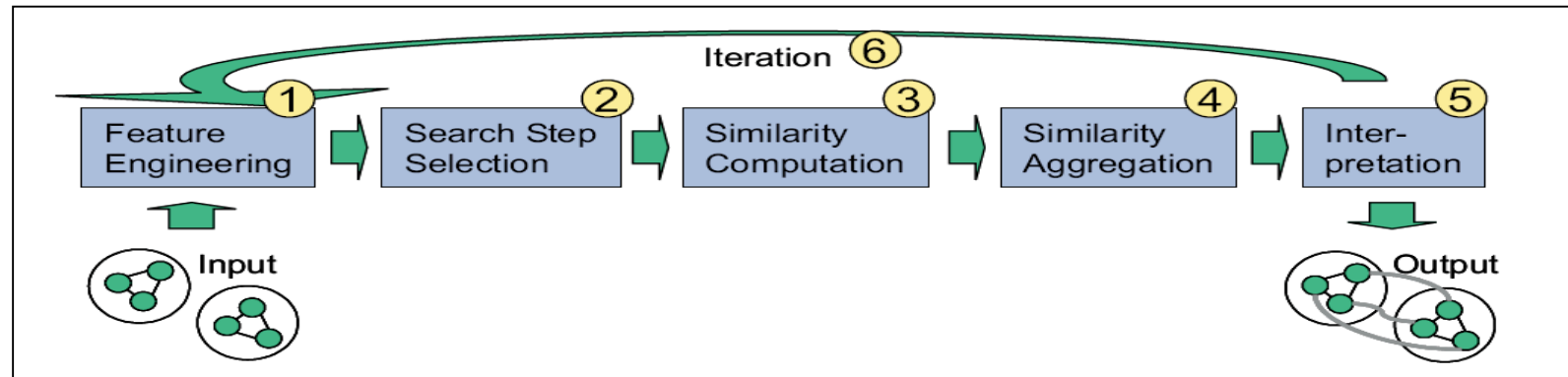
Jambalaya version 2.5.0, Build: 3, 2006/11/06 14:02
CHISEL Group, University of Victoria, chisel-support@cs.uvic.ca

Protege Wizards v1.0 beta build 14
Loaded owl wizards library
INFO: Load time for file:\C:\Programme\Protege_3.2.1\foam\ontologies\tourismA.pprj = 6 sec <project> + 10 sec <ui>
```



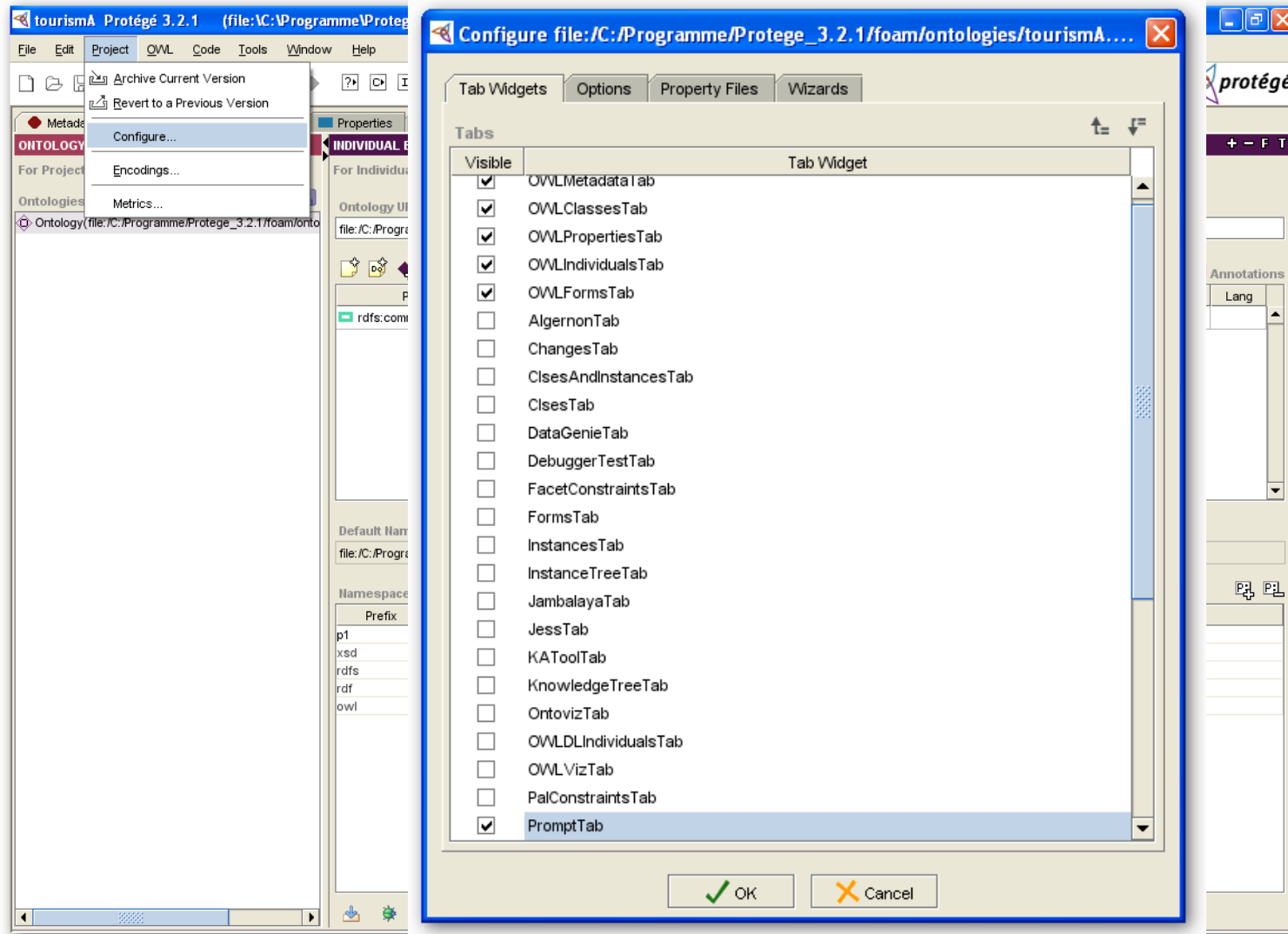
- Framework for Ontology  
Alignment and Mapping
- Liefert Vorschläge für mappings
- Ist im prompt – tab integriert

# Funktionsweise



1. Bestandteile und Strukturen einlesen
2. Vergleichsobjekte wählen
3. Gleichheit ermitteln
4. Gesamt-Gleichheit ermitteln
5. Berechnungsergebnis mit Parametern vergleichen
6. Iteration

# foam bzw. prompt einblenden



# foam konfigurieren

tourismA Protégé 3.2.1 (file:/C:/Programme/Protege\_3.2.1/foam/ontologies/tourismA.pprj, OWL / RDF Files)

File Edit Project OWL Code Tools Window Prompt Help

MANAGING MULTIPLE ONTOLOGIES

Compare your current ontology to a different version of the same ontology.

Map two ontologies and transform the data from one to another.

Extract a portion of another ontology and add it to your current project.

Move frames between your current including project and one of the included projects

Merge two ontologies and add the resulting merged ontology to your current project.

Choose the first source project  Alias   preferred

Choose the second source project  Alias   preferred

Choose the algorithm to use in initial comparison  
FOAM Plugin for Prompt

Algorithm configuration:

Max iterations:  Max error:

Cut off:  Strategy:

Efficiency:  Comparison:

Choose the options for storing mappings

Store mapping using a simple mapping ontology

Choose the Mapping project (optional, must have been generated by this plugin)

Store mappings using the Domain\_PSM ontology

Choose the Mapping project (optional, must have been generated by this plugin)

Click here to begin

# Parameter

Choose the algorithm to use in initial comparison

FOAM Plugin for Prompt

**Algorithm configuration:**

Max iterations:	<input type="text" value="10"/>	Max error:	<input type="text" value="0.9"/>
Cut off:	<input type="text" value="0.9"/>	Strategy:	<input type="text" value="Decision Tree"/>
Efficiency:	<input type="text" value="Efficient"/>	Comparison:	<input type="text" value="Decision Tree"/>

Equal labels  
Only labels  
Manual Weighted  
Manual Sigmoid  
Machine  
Decision Tree

✓ Click here



# Parameter – Beschreibung

- Max error: Alignments mit diesem Gleichheitswert werden dem user zur Überprüfung vorgelegt
- Cut off: Mindest – Gleichheitswert
- Efficiency: kompletter oder effizienter Vergleich
- Comparison: berücksichtigt auch Duplikate des selben namespaces.

# Strategien

- Equal Labels – nur gleiche Namen<sup>1</sup>
- Only Labels – ähnliche Namen<sup>2</sup>
- Manual Weighted – Von Experten vergebene Wichtigkeit von Vergleichsteilen<sup>3</sup>
- Manual Weighted Sigmoid – Expertenvergabe mit schwankenden Werten<sup>4</sup>
- Machine – Gelerntes wird wiederverwendet<sup>5</sup>
- Decision Tree – Entscheidungsbaum<sup>6</sup>

# Tests 1

- Dieselben Ontologien aufeinander gemappt ergibt 0 Kandidaten
- Mergen der selben Ontologien geht auch nicht, ebenfalls 0 Kandidaten
- Anderer Algorithmus (lexical matching) liefert sehr wohl Ergebnisse

# Tests 2

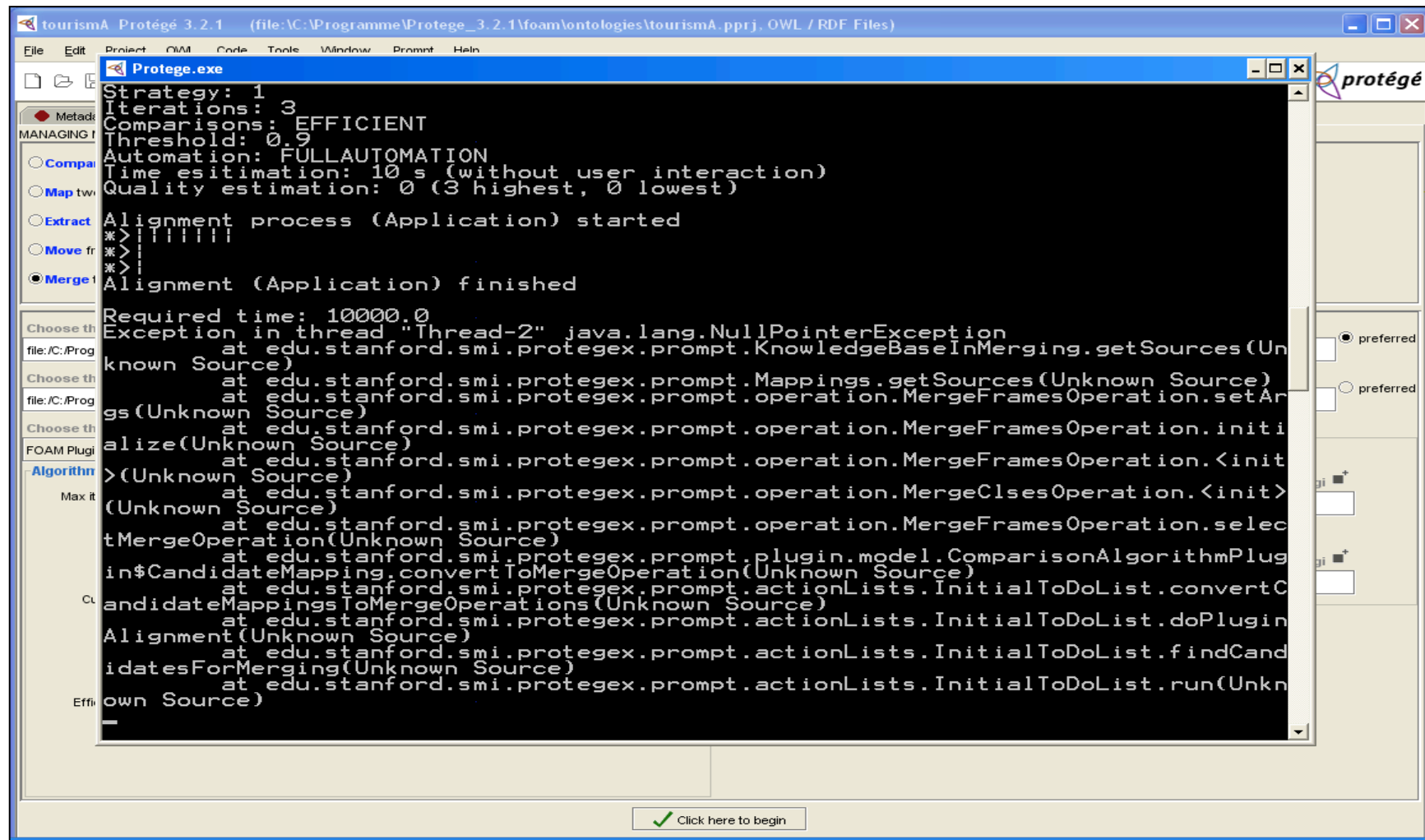
- tourismA.pprj – ca. 415 Klassen
- tourismB.pprj – ca. 570 Klassen
- Durchwachsene und nicht gleichbleibende Ergebnisse – Heuristik
- "Hohe" Anzahl Iterationen führt zu OutOfMemoryException
- Merging wirft regelmäßig NullPointerException – wahrscheinlich Schuld von prompt, nicht foam

# Map

<b>Map</b>			
<b>Strategie</b>	<b>Iterationen</b>	<b>Durchführung</b>	<b>Kandidaten</b>
Equal Labels	1	fehlerfrei	135; A: 106, B: 110
	10	fehlerfrei	135; A: 106, B: 109
Only Labels	1, 2, 3	fehlerfrei	152; A: 148, B: 148
	4, 5	fehlerfrei	153; A: 149, B: 149
	6 – 10	OutOfMemory	
Manual Weighted	1	fehlerfrei	152; A: 148, B: 148
	2	fehlerfrei	137; A: 106, B: 110
	3 – 10	OutOfMemory	
Manual Sigmoid	1	fehlerfrei	152; A: 148, B: 148
	2	fehlerfrei	146; A: 115, B: 120
	3 – 10	OutOfMemory	
Machine	1	fehlerfrei	152; A: 148, B: 148
	2 – 10	NullPointerException	
Decision Tree	1	fehlerfrei	152; A: 148, B: 148
	2 – 10	NullPointerException	

<b>Merge</b>			
<b>Strategie</b>	<b>Iterationen</b>	<b>Durchführung</b>	<b>Kandidaten</b>
Equal Labels	1 – 10 (1. Versuch)	NullPointerException	
	1 (2. Versuch)	fehlerfrei	135
	10 (2. Versuch)	fehlerfrei	136
Only Labels	1 – 4 (1. Versuch)	NullPointerException	
	1 – 4 (2. Versuch)	fehlerfrei	152
	5 – 10	OutOfMemory	
Manual Weighted	1, 2 (1. Versuch)	NullPointerException	
	1 (2. Versuch)	fehlerfrei	152
	2 (2. Versuch)	fehlerfrei	137
	3 – 10	OutOfMemory	
Manual Sigmoid	1 (1. Versuch)	NullPointerException	
	1 (2. Versuch)	fehlerfrei	152
	2 (1. Versuch)	NullPointerException	
	2 (2. Versuch)	fehlerfrei	148
	3 – 10	OutOfMemory	
Machine	1 (1. Versuch)	NullPointerException	
	1 (2. Versuch)	fehlerfrei	152
	2 – 10	NullPointerException	
Decision Tree	1 (1. Versuch)	NullPointerException	
	1 (2. Versuch)	fehlerfrei	152
	2 – 10	NullPointerException	

# NullPointerException



The screenshot shows the Protege 3.2.1 interface with a console window displaying the following text:

```
Strategy: 1
Iterations: 3
Comparisons: EFFICIENT
Threshold: 0.9
Automation: FULLAUTOMATION
Time estimation: 10 s (without user interaction)
Quality estimation: 0 (3 highest, 0 lowest)
Alignment process (Application) started
* > | | | | | | |
* > | | | | | | |
* > | | | | | | |
* > | | | | | | |
Alignment (Application) finished

Required time: 10000.0
Exception in thread "Thread-2" java.lang.NullPointerException
    at edu.stanford.smi.protege.prompt.KnowledgeBaseInMerging.getSources(Unknown Source)
    at edu.stanford.smi.protege.prompt.Mappings.getSources(Unknown Source)
    at edu.stanford.smi.protege.prompt.operation.MergeFramesOperation.setArguments(Unknown Source)
    at edu.stanford.smi.protege.prompt.operation.MergeFramesOperation.initialize(Unknown Source)
    at edu.stanford.smi.protege.prompt.operation.MergeFramesOperation.<init>(Unknown Source)
    at edu.stanford.smi.protege.prompt.operation.MergeClassesOperation.<init>(Unknown Source)
    at edu.stanford.smi.protege.prompt.operation.MergeFramesOperation.selectMergeOperation(Unknown Source)
    at edu.stanford.smi.protege.prompt.plugin.model.ComparisonAlgorithmPlugin.$CandidateMapping.convertToMergeOperation(Unknown Source)
    at edu.stanford.smi.protege.prompt.actionLists.InitialToDoList.convertCandidateMappingsToMergeOperations(Unknown Source)
    at edu.stanford.smi.protege.prompt.actionLists.InitialToDoList.doPluginAlignment(Unknown Source)
    at edu.stanford.smi.protege.prompt.actionLists.InitialToDoList.findCandidatesForMerging(Unknown Source)
    at edu.stanford.smi.protege.prompt.actionLists.InitialToDoList.run(Unknown Source)
    at java.lang.Thread.run(Unknown Source)
```

The interface also shows a sidebar with various options like 'Merge 1' selected, and a 'Click here to begin' button at the bottom.





# Bemerkungen

- Nach einem map oder merge Vorgang den Algorithmus erneut zu starten erfordert Neustart des Programms.
- Ein mapping in prompt rückgängig zu machen ist nicht möglich.
- Qualität der mappings nicht feststellbar, da kein "GoldStandard" vorhanden.

# Quellen

- Folie 2, 4: <http://www.aifb.uni-karlsruhe.de/WBS/meh/foam/> (2007/01/23)
- Folie 5: <http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-156/paper11.pdf> (2007/01/23)
- Folie 9: <http://www.aifb.uni-karlsruhe.de/WBS/meh/foam/description.htm> (2007/01/23)
- Folie 10/1: package edu.unika.aifb.foam.rules – EqualLabelRule.java
- Folie 10/2: package edu.unika.aifb.foam.agenda – ClosestLabelAgenda.java
- Folie 10/3: package edu.unika.aifb.foam.combination – ManualWeightsLinear.java
- Folie 10/4: package edu.unika.aifb.foam.combination – ManualWeightsSigmoid.java
- Folie 10/5: package edu.unika.aifb.foam.combination – MachineLearn.java
- Folie 10/6: package edu.unika.aifb.foam.combination – DecisionTree.java

Danke für die Aufmerksamkeit!

Noch Fragen?