# Semi-Automatic Information and Knowledge Systems

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Exercises & Presentations

Monika Lanzenberger

- 15 topics are available:
  different ontology mapping and merging tools (some with graphical interfaces) and related work

- Select one topic
  either alone or together with another colleague
- Investigate and read the given references
- Search for additional material
- Test ontologies are available on the web:
  http://www.aifb.uni-karlsruhe.de/WBS/meh/foam/ontologies.htm

- Prepare a 15 minutes talk
- Teams prepare a 30 minutes talk

- Send the presentation material
  10 days before your talk to ML
- Include the feedback and produce
  a final version of the presentation material

- Participate in the discussions
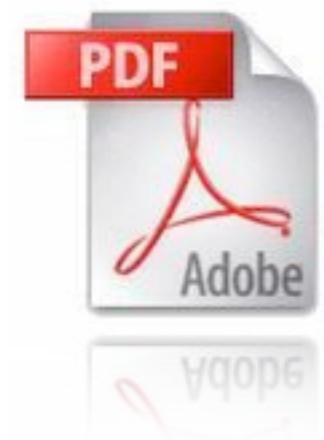
Framework for Ontology Alignment and Mapping

- University of Karlsruhe, Germany
- Fully or semi-automatically aligns
  two or more OWL ontologies
- Heuristics (similarity) of the individual entities
  (concepts, relations, and instances)
- Java application, web service and Protégé plug-in available

Resources:

- http://www.aifb.uni-karlsruhe.de/WBS/meh/foam/
- http://www.aifb.uni-karlsruhe.de/WBS/meh/publications/ehrig04similarityPAKM.pdf
- http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-156/paper11.pdf
- http://www.moemais.ufam.edu.br/plugin.php
- http://protege.stanford.edu/download/download.html
- http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS//Vol-156/paper11.pdf

Deliverables:

- Run FOAM with the tourism ontologies (application, web service, and plug-in)
- Search for additional material / literature
- Prepare slides and a demo for your short presentation

Manage multiple ontologies

- Stanford University, CA, USA
- Plug-in for Protégé
- Manages ontologies:
  map, compare, merge, move, extract
- Creates visual representations of the differences
  between two versions of an ontology

[thechiselgroup.org]

Resources:

- http://protege.stanford.edu/plugins/prompt/prompt.html
- http://smi.stanford.edu/smi-web/reports/SMI-2003-0973.pdfChisel logo
- http://www.thechiselgroup.org/promptviz
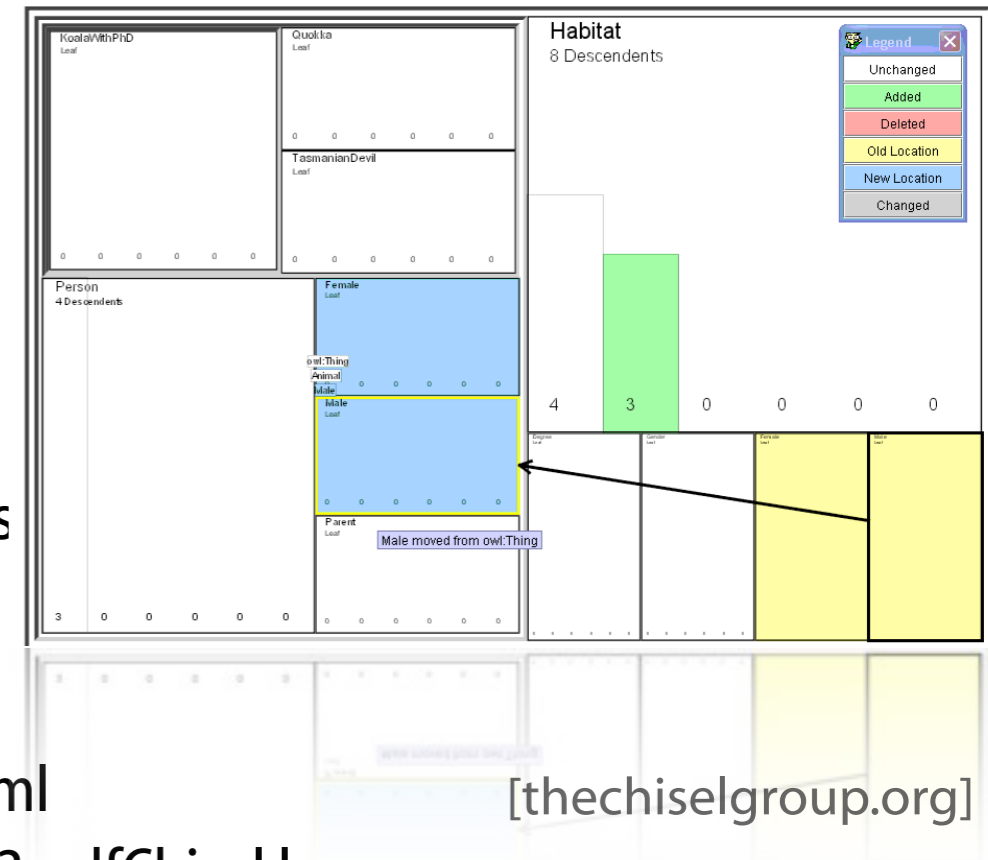- http://protege.stanford.edu/download/download.html

Deliverables:

- Install Protégé and test PROMPT and PROMPTViz
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is the PROMPT suite? What is PromptViz?
  How do they work in principle and in practice?
  Describe strengths and shortcomings of both tools.

Manage multiple ontologies

- Stanford University, CA, USA
- Plug-in for Protégé
- Map, compare, merge, move, extract
- Visual representation

[Sean Falconer]

Resources:

- http://protege.stanford.edu/plugins/prompt/prompt.html
- http://smi.stanford.edu/smi-web/reports/SMI-2003-0973.pdf
- http://protege.cim3.net/cgi-bin/wiki.pl?PluginsForPrompt
- http://www.cs.uvic.ca/~seanf/cogz/cogz.html
- http://protege.stanford.edu/download/download.html

Deliverables:

- Install Protégé and run the CogZ Plug-in
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is Prompt? What is CogZ? How to develop plug-ins for Prompt?
  How does CogZ work in principle and in practice? What is the benefit of the visualization?
  Describe strengths and shortcomings of the tool.
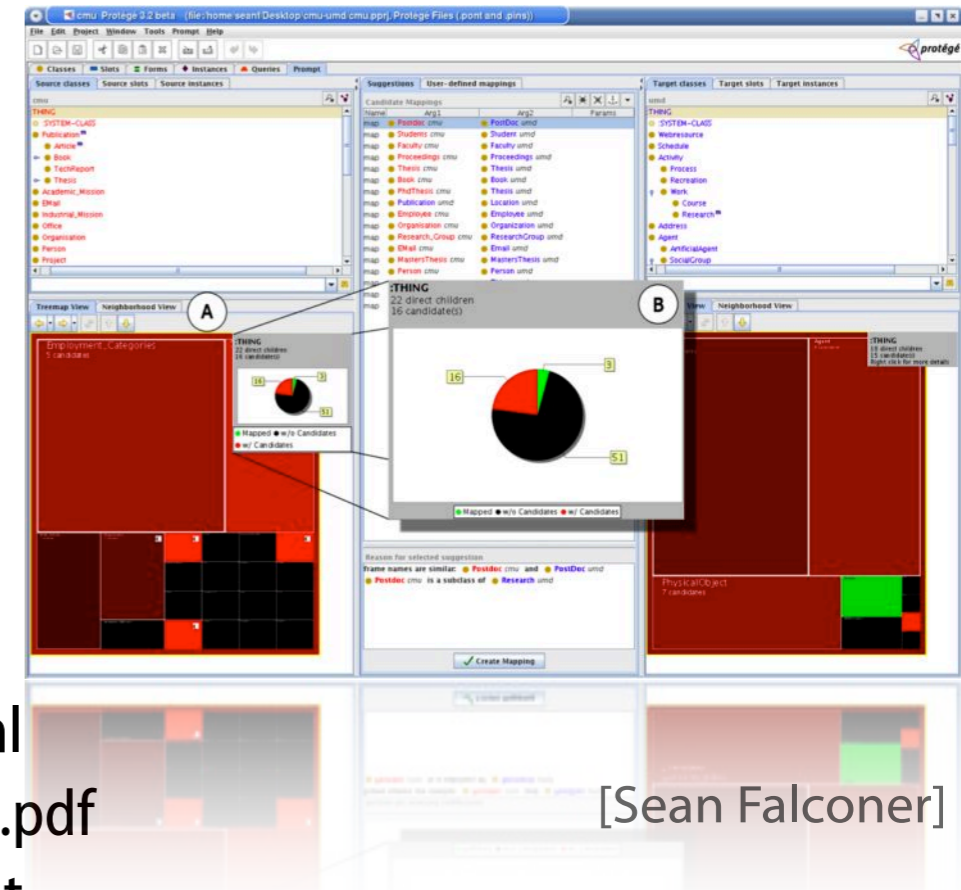
Risk Minimization based Ontology Mapping

- Tsinghua University, Beijing, China
- Maps entities (n:1, 1:null, null:1, and 1:1)
- Each entity e_{i1} (O_1) can be classified to one 'class' e_{i2} (O_2).
- Classification as a special case of Bayesian decision problem
- loss function
- Find minimal risk for each sample

Resources:

- http://keg.cs.tsinghua.edu.cn/project/RiMOM/
- http://www.websemanticsjournal.org/ps/pub/showDoc.Fulltext/document.pdf?
  lang=en&doc=2006-2&format=pdf&compression=
- http://www.dit.unitn.it/~p2p/OM-2006/17-RiMOM-OAEI'06.pdf

Deliverables:

- Install and run RiMOM
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is RiMOM? How does it work in principle and in practice?
  Describe strengths and shortcomings of the tool. Outline an application scenario.

OWL Lite Alignment, VisOn

- University of Montreal, Canada
- Java tool for ontology alignment
- Graph-based approach to represent ontologies

Resources:

- http://www.iro.umontreal.ca/%7Eowlola/userguide.html
- http://www.iro.umontreal.ca/%7Eowlola/pdf/align-compet-EON.pdf
- http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS//Vol-156/paper15.pdf

Deliverables:

- Install the relevant tools
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is VisOn? How is the alignment done? What is the benefit of the visualization?
  How does OLA works in principle and in practice?
  Describe strengths and shortcomings of the tool.

Supports users in creating and maintaining distributed ontologies on the web

- Stanford University, CA, USA
- Merging multiple ontologies
- Diagnosing individual or multiple ontologies

Resources:

- http://ksl.stanford.edu/software/chimaera/
- http://www.ksl.stanford.edu/people/dlm/papers/kr2000-camera-ready-copy-withcitation.doc

Deliverables:

- Install and run Chimaera
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is Chimaera?
  How does it work in principle and in practice?
  Describe strengths and shortcomings of the tool.
  Is there ongoing work or is it outdated?

Automatic ontology matching tool

- Southeast University, Nanjing, China
- For OWL Lite/DL ontologies (schema-level)
- Three matchers integrated in Falcon-AO:
  V-Doc, String (includes edit distance and I-Sub) and GMO + PBM for large-scale ontologies (partition-based block matching).

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/11-Falcon-OAEI'06.pdf
- http://xobjects.seu.edu.cn/project/falcon/matching/resources.html
- http://xobjects.seu.edu.cn/project/falcon/pub/Falcon-AO%20-%20Aligning%20Ontologies%20with%20Falcon.pdf
- http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS//Vol-156/paper13.pdf

Deliverables:

- Install Falcon-AO and run it
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is Falcon-AO?
  How does it work in principle and in practice?
  Describe strengths and shortcomings of the tool.

Schema and Ontology Matching

- University Leipzig, Germany
- Identifies semantic correspondences between metadata structures or models such as database schemas, XML message formats, and ontologies
- Graphical interface

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/9-coma-OAEI'06.pdf
- http://dbs.uni-leipzig.de/file/comaplusplus.pdf
- http://dbs.uni-leipzig.de/Research/coma_index.html
- http://dbs.uni-leipzig.de/Research/coma.html

Deliverables:

- Install COMA++ and run it
- Search for additional material / literature
- Prepare slides and a demo for your short presentation

  What is COMA++? What is the benefit of the graphical interface?

  How does it work in principle and in practice?

  Describe strengths and shortcomings of the tool.

  Outline an application scenario.

Automating Ontology Mapping through Synthesis of Approaches

- University of the Aegean, Samos, Greece
- Integrates several matching methods: lexical, semantic and structural
- Based on HCONE-merge and COCLU (COmpression-based CLUstering))
- Concepts, instances and properties are investigated for similarity

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/8-automs-OAEI'06.pdf
- http://www.icsd.aegean.gr/incosys_old/Projects/AUTOMS/OAEI/
- http://www.websemanticsjournal.org/ps/pub/showDoc.Fulltext/document.pdf?
  lang=en&doc=2005-33&format=pdf&compression=
- http://www.ifs.tuwien.ac.at/~mlanzenberger/teaching/WS0607/SAIKS/stuff/automs.zip

Deliverables:

- Install and run AUTOMS
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is AUTOMS? Describe the different matching methods.
  How does AUTOMS work in principle and in practice?

Framework for Ontology Alignment and Mapping

- Silesian University of Technology, Gliwice, Poland
- Java Tool for OWL DL ontologies
- Uses WordNet as a source of lexical and domain knowledge
- Maps classes and properties

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/15-OWL-CtxMatch-OAEI'06.pdf
- http://www-zo.iinf.polsl.gliwice.pl/~niedbyk/oaei2006/
- For more information on the installation procedure ask ML

Deliverables:

- Install and run OWL-CTXMatch
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is CTX-Match? What is OWL-CTXMatch?
  How does OWL-CTXMatch work in principle and in practice?
  Describe strengths and shortcomings of the tool.

Formal Concept Analysis

- Merges ontologies bottom-up based on common instances
- Concepts are generated, explored and transformed to the merged ontology

Resources:

- http://www.aifb.uni-karlsruhe.de/WBS/gst/papers/2001/IJCAI01.pdf

Deliverables:

- Search for additional material / literature
- Prepare slides for your short presentation
  What is FCA-Merge?
  How does it work in principle?
  Describe strengths and shortcomings of this approach.
  Outline an application scenario.

CROSI Mapping System

- University of Southampton, UK & Hewlett Packard Laboratories
- Uses name matchers (e.g. WordNet) and semantic matchers (structure- and intension-aware)
- Identifies corresponding entities

Resources:

- http://www.aktors.org/crosi/deliverables/downloads/
- http://www.aktors.org/crosi/deliverables/pdfs/kcap05kh.pdf
- http://www.aktors.org/crosi/
- http://eprints.ecs.soton.ac.uk/11717/01/crosi-final-report.pdf

Deliverables:

- Install and run CMS
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is CMS?
  How does it work in principle and in practice?
  Describe strengths and shortcomings of the tool.

Framework for automatically aligning OWL ontologies

- ISTI-Italian National Research Council, Pisa, Italy
- Identifies mapping candidates together with their weights
- Uses different classifiers to estimate the quality of a mapping

Resources:

- http://homepages.cwi.nl/~troncy/
- http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-156/paper14.pdf
- http://faure.isti.cnr.it/~straccia/download/papers/SWAP05/SWAP05.pdf

Deliverables:

- Install and run oMap
- Search for additional material / literature
- Prepare slides and a demo for your short presentation
  What is oMap? Which classifiers are applied?
  How does it work in principle and in practice?
  Describe strengths and shortcomings of the tool.
  Outline an application scenario.

Exploiting the structure of background knowledge used in ontology matching

Zharko Aleksovski, Warner ten Kate, and Frank van Harmelen

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/2-Aleksovski-TP-OM'06.pdf

Deliverables:

- Search for relevant additional material / literature
- Prepare slides for your short presentation
  Why should we use background knowledge?
  Discuss the results of the paper: Describe strengths and shortcomings.
  Outline an application scenario.

Towards understanding the needs of cognitive support for ontology mapping

Sean M. Falconer, Natalya F. Noy, and Margaret-Anne Storey

Resources:

- http://www.dit.unitn.it/~p2p/OM-2006/3-Falconer-TP-OM'06.pdf

Deliverables:

- Search for relevant additional material / literature
- Prepare slides for your short presentation
  How can we support the ontology mapping process? How to apply visualization methods?
  Discuss the results of the paper: Describe strengths and shortcomings of current user interfaces.