Ontology and Ontology Learning – A Research Review

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Outline

1. Ontologies and our standing point
2. People Working on Ontology and Ontology Learning
   1. People around the world
   2. People in Iran
3. Ontology learning theses
   1. Finished
   2. In progress
4. Books and Journal papers
5. Ontology Engineering Tree
Ontologies and our standing point

- Ontology Recommendation
- Ontology Visualization
- Ontology Validation
- Ontology Population
- Ontology Matching
- Ontology Interoperability
- Ontology Integration
- Ontology Evaluation
- Ontology Engineering Tools
- Ontology Definition
- Ontology Methodologies
- Ontology Design
- Ontology Learning
- Ontology Maintenance
People Working on Ontology and Ontology Learning
People Working on Ontology and Ontology Learning

- **People around the world**
  - Steffen Staab (University of Koblenz-Landau)
  - York Sure (University of Koblenz-Landau)
  - Paul Buitelaar (National University of Ireland, Galway)
  - Philipp Cimiano (University of Bielefeld)
  - Aldo Gangemi (Laboratory of Applied Ontology (ISTC-CNR))
  - Eva Blomqvist (Semantic Technologies Lab (ISTC-CNR))
People Working on Ontology and Ontology Learning

- **People in Iran**
  - Dr. H. Abolhassani (Sharif University of Technology)
  - Dr. M. Shamsfard (Shahid Beheshti University)
  - Dr. F. Oroumchian (University of Tehran)
  - Dr. M. Rahgozar (University of Tehran)
  - Dr. M. Kahani (Ferdowsi University of Mashhad)
  - Dr. M. Naghibzadeh (Ferdowsi University of Mashhad)
  - Dr. M. A. Nematbakhsh (University of Isfahan)
Ontology learning theses (finished)

- Cross-language Ontology Learning
  - Incorporating and Exploiting Cross-language Data in the Ontology Learning Process
    - Hans Hjelm (PhD 2009) Department of Linguistics, Stockholm University
- Personalised ontology learning and mining for web information gathering
  - Xiaohui Tao (PhD 2009) Faculty of Science and Technology Institution, Queensland University of Technology
- Personal ontology learning
  - Grace Hui Yang (PhD 2009) Carnegie Mellon University (CMU)
- Learning Ontologies From Text Collections and Evaluating Them Against Gold Standards
  - Ilias Zavitsanos (PhD 2009) University of the Aegean Greece
- Ontology Population in the context of Ontology Maintenance
  - Alex Valarakos (PhD 2009) University of the Aegean Greece
- Role and application of ontology design patterns in bio-ontologies
  - Mikel Egana Aranguren (PhD 2009) University of Manchester
- Managing Vagueness in Ontologies
  - Fernando Bobillo Ortega (PhD 2008) University of Granada, Spain
- Domain Ontology Learning from the Web
  - David Sánchez Ruenes (PhD 2007) Universitat Politècnica de Catalunya BarcelonaTech (UPC)
- Developing ontologies in the biological domain
  - Alexander García Castro (PhD 2007) The University of Queensland
- Towards Methodological Principles for Ontology Engineering
  - Mustafa Jarrar (PhD 2005) Vrije Universiteit Brussel
- Comparison of ontology learning techniques for Quranic text
  - Kim Mey Chew (MSc 2010), Computer Science and Information System, Universiti Teknologi Malaysia (UTM)
- Ontology Learning in Large Software Repositories
  - Georg Zajko (MSc 2010) Vienna University of Economics and Business
Ontology learning theses (in progress)

- Supervised document to ontology interlinking
  - Gabor Settimio Melli (PhD 2010) Simon Fraser University Canada

- Automatically Learning Text Patterns to Extract Relations from Domain Documents (Open Thesis) SemanticLab.net 2011
Books and Journal papers

- W. Wong, W. Liu, M. Bennamoun, *Ontology Learning and Knowledge Discovery Using the Web: Challenges and Recent Advances*, IGI, 2011
- P. Buitelaar, P. Cimiano, and B. Magnini, “*Ontology learning from text: methods, evaluation and applications,*” *Computational Linguistics*, vol. 32, no. 4.,2003
Ontology Engineering Tree
Ontology Engineering

- Pre-engineering activities
- Engineering activities
- Post-engineering activities
Ontology Engineering

- engineering activities

Ontology Learning

- Term Extraction
- Synonym enrichment
- Concept creation (formation)
- Relation Extraction and Enrichment
- Axiom and Rule Enrichment

Axiom and Rule Enrichment

- Description Logic
- First Order Logic
- Higher Order Logic
Thank you for your attention.

Questions ?
Suggestions ?
People Working on Ontology and Ontology Learning
Ontology Learning people around the world

- **Steffen Staab**
  - Professor, Faculty of Computer Science of the University of Koblenz-Landau

- **York Sure**
  - Full Professor at the Faculty for Computer Science of the Universität Koblenz-Landau, Campus Koblenz
  - Scientific Director, the GESIS - Leibniz Institute for the Social Sciences in Bonn
Ontology Learning people around the world

- **Paul Buitelaar**
  - Senior Research Fellow & Adjunct Lecturer, DERI, National University of Ireland, Galway
  - Head of the DERI Unit for Natural Language Processing (UNLP)
  - Leader of the DERI Semantic Information Mining Stream (SIM)
Ontology Learning people around the world

- **Philipp Cimiano**
  - Professor at the University of Bielefeld
  - Leads the Semantic Computing group
    - highest-cited paper: *Towards the self-annotating web.* (2004) at WWW (Cited By 244)
    - *Ontology Construction* (book chapter 2010)
  - Worked on the following OL systems:
    - Text2Onto
    - TextToOnto
Ontology Learning people around the world

• **Aldo Gangemi**
  • Scientific coordinator and Research scientist and co-founded the Rome unit of the Laboratory of Applied Ontology (Semantic Technology Lab, ISTC-CNR)
    • highest-cited paper: *Sweetening Ontologies with DOLCE* (2002) at EKAW (Cited By 483)
    • *Introducing pattern-based design for legal ontologies* (book chapter 2009)
    • *Experiments on pattern-based ontology design* (paper 2009)
    • *Experimenting with eXtreme Design* (paper 2010)
    • *Knowledge Engineering: Practice and Patterns* (paper 2008)
Ontology Learning people around the world

• **Eva Blomqvist**
  • Postdoc in the Semantic Technologies Lab, at the research institute ISTC-CNR in Rome, Italy
  • Postdoc subject
    • methods for user centered selection and use of ontology design patterns in ontology engineering
  • highest-cited paper: *Patterns in Ontology Engineering: Classification of Ontology Patterns* (paper 2005) at ICEIS (Cited By 35)
  • OntoCase - Automatic Ontology Enrichment Based on Ontology Design Patterns (paper 2009)
  • Pattern Ranking for Semi-automatic Ontology Construction (paper 2008)
  • OntoCase - A Pattern-based Ontology Construction Approach (paper 2007)
  • Pattern-based Ontology Construction (Ph.D. paper 2007)
Universities in Iran

- Sharif University of Technology
- Shahid Beheshti University
- University of Tehran
- Ferdowsi University Of Mashhad
- University of Isfahan
Sharif University of Technology

• Dr. H. Abolhassani
  • Founder of the Web Intelligence Laboratory
  • highest-cited paper: Different Aspects of Social Network Analysis. (paper 2006) at Web Intelligence (Cited By 59)

  • Automatic Extraction of IS-A Relations in Taxonomy Learning (paper 2008)
    • M. Neshati, H. Abolhassani, H. Fatemi

  • Ontology Learning and Taxonomy Construction from Text Corpus (MSc. thesis 2007)
    • M. Neshati

  • Improving present approaches for expanding an ontology, with emphasis on word sense disambiguation (MSc. thesis 2008 – current)
    • A. Seraj
Dr. M. Shamsfard

- Founder of the Natural Language Processing Laboratory
- highest-cited paper: Learning ontologies from natural language texts. (journal paper 2004) at International Journal of Human-Computer Studies (Cited By 83)

- Extracting Conceptual Relations from Persian Resources (paper 2010)
  - H. Fadaei , M. Shamsfard

- Semi Automatic Development of FarsNet; The Persian WordNet (paper 2010)

- Extracting Lexico-conceptual knowledge for Developing Persian WordNet ( paper 2010)
  - M. Shamsfard, H. Fadaei , E. Fekri
University of Tehran

- Dr. F. Oroumchian and Dr. M. Rahgozar
  - Application of taxonomic relations for finding similarity relationships in ontology learning (paper 2007)
    - A. Vazifedoost, F. Oroumchian, M. Rahgozar

- Finding similarity relations in presence of taxonomic relations in ontology learning systems (paper 2007)
  - A. Vazifedoost, F. Oroumchian, M. Rahgozar

- Creating a Persian ontology through thesaurus reengineering for organizing the Digital Library of the National Library of Iran (paper 2007)
  - F. Khosravi, A. Vazifedoost
Ferdowsi University Of Mashhad

- Dr. M. Kahani
  - Building ontologies from relational databases (paper 2009)
    - K. Etminani (phd student), M. Kahani, N. A. Raeeji

- Dr. M. Naghibzadeh
  - Overlapped Ontology Partitioning Based on Semantic Similarity Measures (submitted paper 2010)
    - K. Etminani, A. Rezaeian Delui, M. Naghibzadeh, N. A. Raeeji
University of Isfahan

- Dr. M. A. Nematbakhsh
  - A New Model to Learn Domain Ontology from World Wide Web Corpus (paper 2008)
  - H. Khosravi Farsani (Ph.D. student)
  - M. A. Nematbakhsh