FAKULTÄT FÜR !NFORMATIK
Faculty of Informatics

Master‘s Thesis Presentation

kbs Knowledge-Based Systems Group
SIEMENS

Towards an Alternative Approach for Combining Ontology Matchers

Master‘s Degree:
Software Engineering & Internet Computing

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PROBLEM STATEMENT

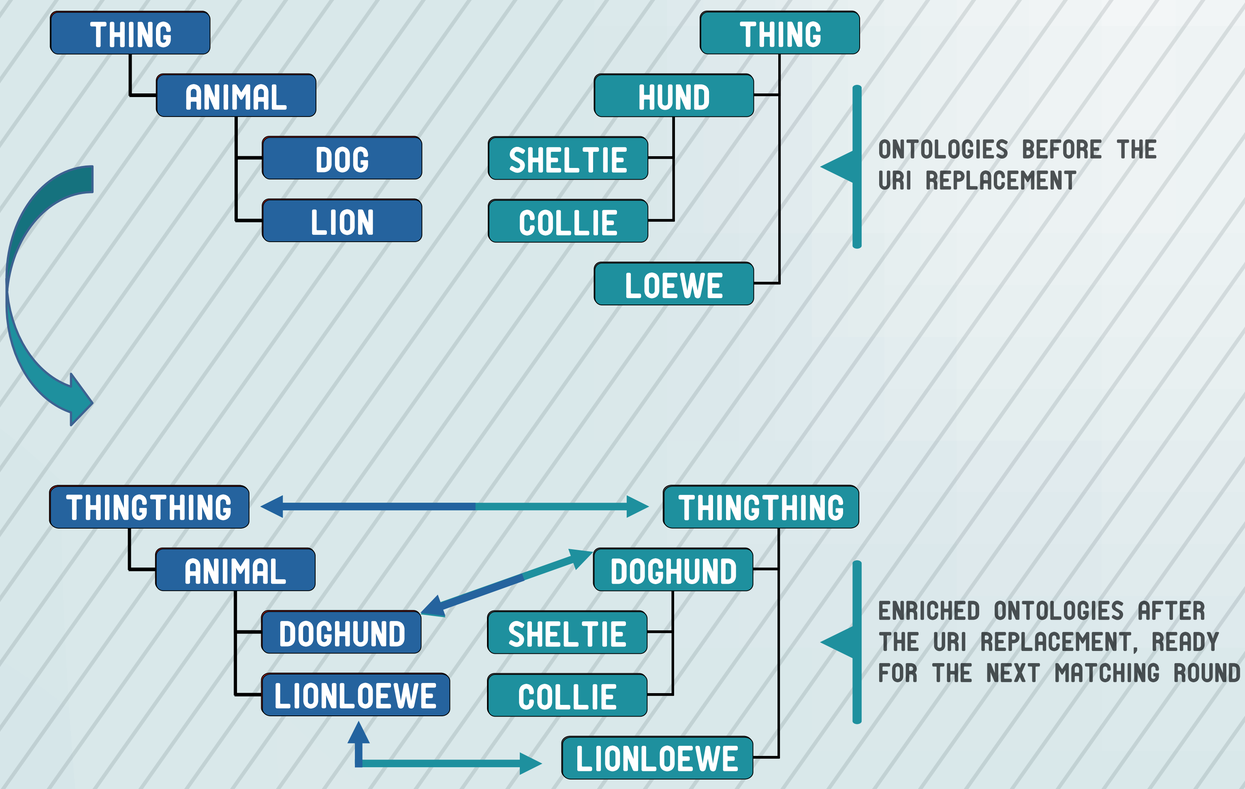
1 - THERE IS NO UNIVERSAL ONTOLOGY MATCHER
SINCE EVERY MATCHER HAS ITS STRENGTHS AND WEAKNESSES, THEY USUALLY PERFORM WELL ON SPECIFIC TYPES OF DATASETS BUT BAD ON OTHERS.

2 - HOW TO CHOOSE THE RIGHT ONTOLOGY MATCHER?
DECIDING WHICH MATCHER IS BEST SUITABLE FOR A SPECIFIC SET OF ONTOLOGIES USUALLY REQUIRES A HUGE AMOUNT OF PREPERATORY WORK AND LEADS TO A LOSS OF AUTOMATION.

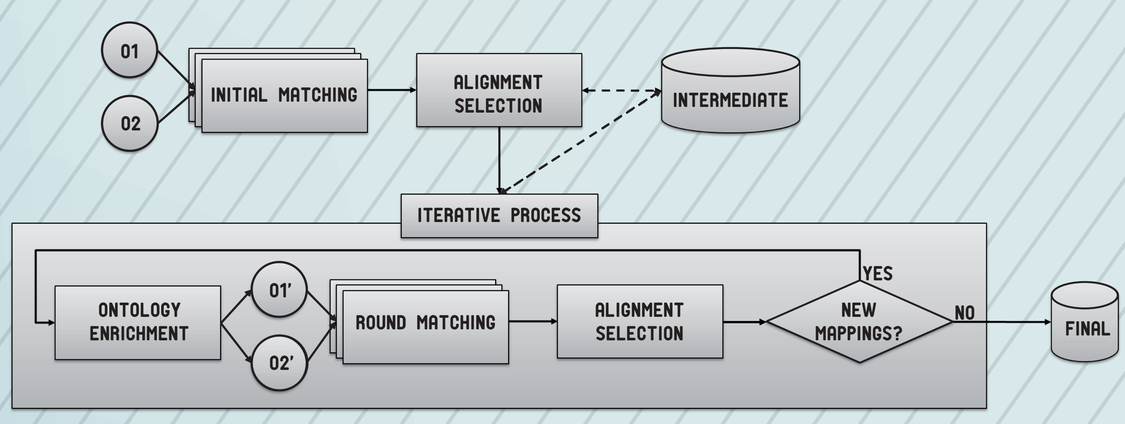
3 - MATCHING LARGE ONTOLOGIES INCREASES THE RUNTIME SIGNIFICALLY
A DRAWBACK OF MATCHING LARGE ONTOLOGIES IS THE INCREASED RUNTIME OF THE MATCHING PROCESS. COMBINING SEVERAL ONTOLOGY MATCHERS USUALLY LEADS TO AN EVEN WORSE RUNTIME PERFORMANCE.

4 - HOW TO COMBINE THE DIFFERENT ONTOLOGY MATCHERS?
COMBINING ONTOLOGY MATCHERS IN A SEMI-AUTOMATIC HUMAN-GUIDED MATCHING PROCESS ISN'T TRIVIAL, SINCE THEY USUALLY AREN'T DESIGNED TO BE USED IN A COMBINED MATCHING APPROACH.

URI REPLACEMENT



MIX'N'MATCH FRAMEWORK



MIX'N'MATCH APPROACH

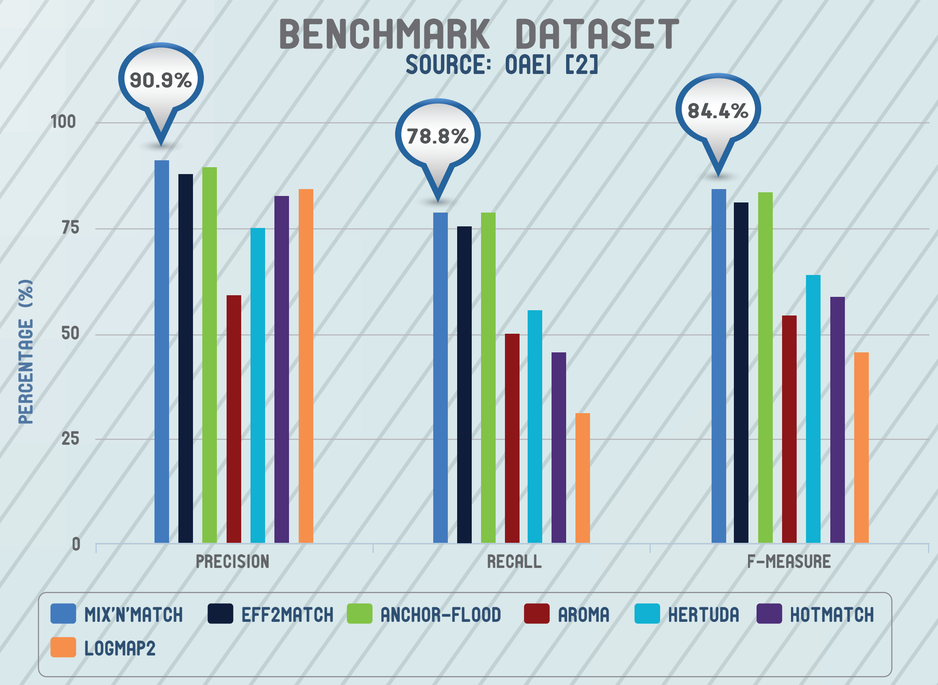
1 - PARALLEL EXECUTION OF ONTOLOGY MATCHERS
BY RUNNING OFF-THE-SHELF MATCHERS SIMULTANEOUSLY WE WERE ABLE TO DECREASE THE RUNTIME OF MIX'N'MATCH BY 50% AND THEREFORE MAKE OUR APPROACH OF COMBINING MANY INDIVIDUAL MATCHERS MORE FEASIBLE.

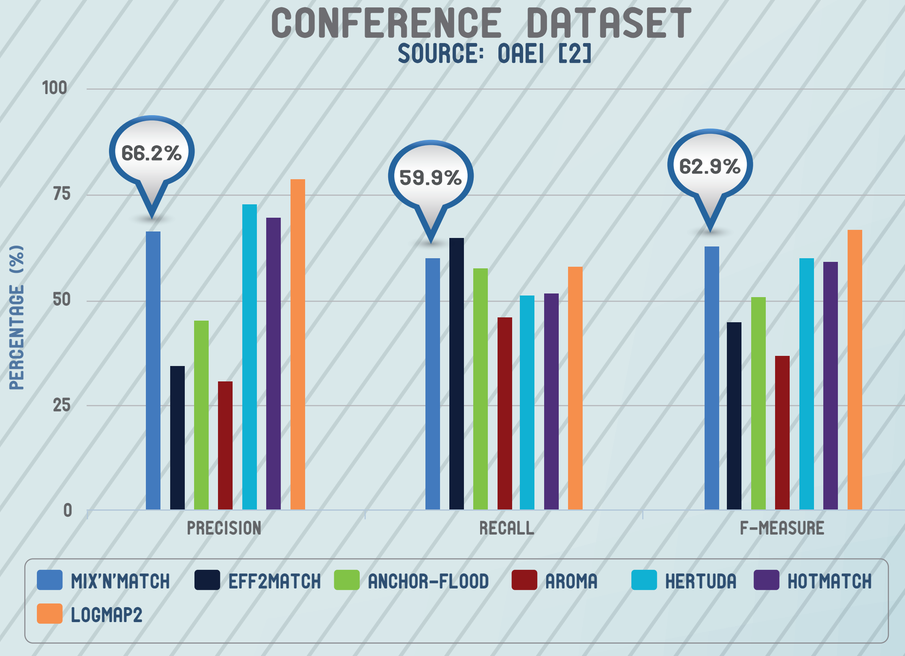
2 - ACCEPTING ALIGNMENTS FOUND BY THE MAJORITY OF THE ONTOLOGY MATCHERS
TO AVOID THE DIFFICULTY OF FINDING THE MOST SUITABLE ONTOLOGY MATCHERS FOR SPECIFIC MATCHING TASKS AS WELL AS BE ABLE TO USE ALIGNMENT SETS WITH A VERY HIGH PRECISION, WE ONLY ACCEPT MATCHINGS WHICH WERE FOUND BY THE MAJORITY OF THE PARTICIPATING ONTOLOGY MATCHERS.

3 - STORE METAINFORMATION OF ALL FOUND ALIGNMENTS
WE STORE INFORMATION ABOUT EVERY FOUND ALIGNMENT DURING THE DIFFERENT MATCHING ROUNDS, TO BE ABLE TO ABORT THE MATCHING PROCESS AT ANY TIME. THIS FEATURE IS CALLED ANYTIME BEHAVIOR AND ALLOWS MIX'N'MATCH TO RETRIEVE MATCHING RESULTS EVEN FOR VERY LARGE ONTOLOGIES IN A REASONABLE TIME.

4 - ENRICH THE ONTOLOGIES BY REPLACING THE URIS OF ACCEPTED ALIGNMENTS
TO BE ABLE TO USE ALIGNMENTS AS ADDITIONAL INFORMATION FOR THE MATCHING PROCESS AND BYPASS THE LACKING FUNCTIONALITY OF CURRENT STATE-OF-THE-ART ONTOLOGY MATCHERS TO USE INPUT ALIGNMENTS FOR ONTOLOGY MATCHING, WE SIMPLY REPLACE THE URIS OF ACCEPTED ALIGNMENTS BY NORMALIZED ONES IN THE TO BE MATCHED ONTOLOGIES AND THEN RERUN THE MATCHING PROCESS TILL NO FURTHER ALIGNMENTS WERE FOUND.

EVALUATION RESULTS





REFERENCES:
[1] STEYSKAL, S., POLLERES, A.(2013). MIX'N'MATCH: AN ALTERNATIVE APPROACH FOR COMBINING ONTOLOGY MATCHERS. IN PROCEEDINGS OF THE 12TH INTERNATIONAL CONFERENCE ON ONTOLOGIES, DATABASES, AND APPLICATIONS OF SEMANTICS (ODBASE 2013) GRAZ, AUSTRIA 2013.
[2] HTTP://OAEI.ONTOLOGYMATCHING.ORG/

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