
ASMOV results for OAEI 2008

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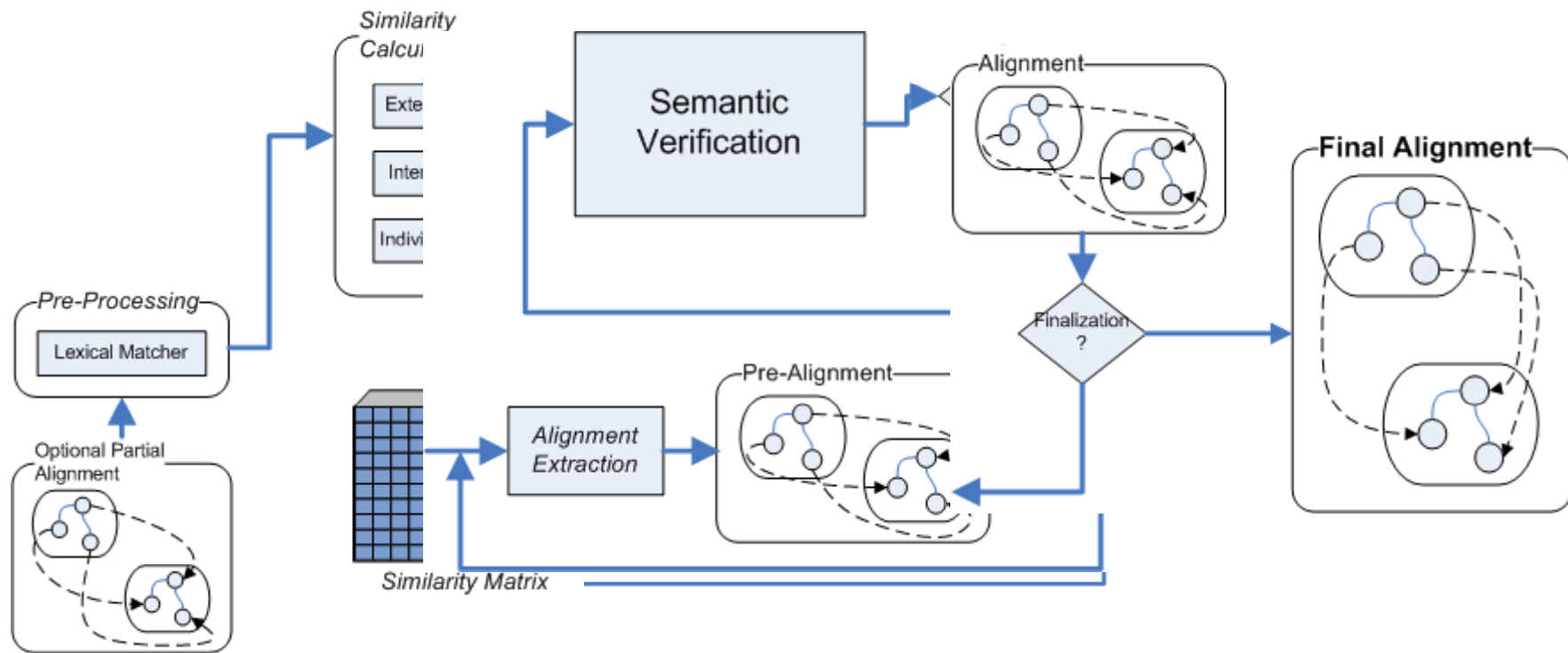
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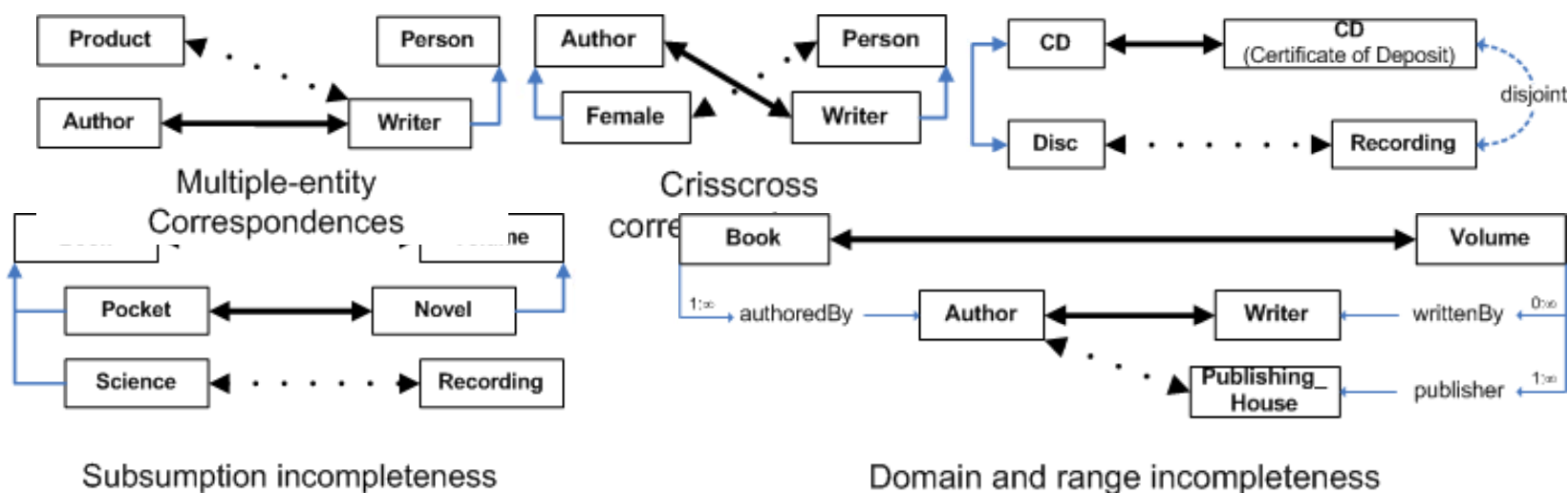
Automated Semantic Mapping of Ontologies with Verification (ASMOV)

- ASMOV is an alignment tool which leverages the semantic knowledge enclosed in pairs of ontologies in order to extract correspondences between their entities.
- Implementation:
 - JAVA 1.5
 - Adapter to thesaurus (WordNet, UMLS,...)
- Applications:
 - Integration of heterogeneous systems using their data source ontologies (NIH Grant).
 - Automated Semantic Cataloging (Lockeed Martin)
- Demo:
 - <http://support.infotechsoft.com/integration/ASMOV/OAEI-2008>

ASMOV Algorithm



ASMOV Algorithm (Semantic Verification)



OAEI 2008 Results (Benchmark)

Level	ASMOV 2008			ASMOV 2007		
	Precision	Recall	Time (sec)	Precision	Recall	Time (sec)
0	1.00	1.00	8.60	1.00	1.00	103.55
1	1.00	1.00	4.91	1.00	1.00	67.06
2	1.00	0.99	6.06	1.00	1.00	70.11
3	0.98	0.99		0.99	0.98	143.65
4	0.99			0.99	0.96	197.09
5	0.96			0.98	0.89	222.43
6	0.94			0.92	0.82	203.65
7	0.93	0.83	7.60	0.89	0.77	194.56
8	0.90	0.71	6.65	0.84	0.72	183.82
9	0.78	0.46	2.61	0.70	0.44	79.38
10	0.40	0.04	0.54	0.38	0.05	17.96
3xx	0.81	0.77	3.42	0.82	0.82	130.72
All	0.95	0.86	75.78	0.93	0.84	1,613.97

Journal ↔ Periodical

Journal

Magazine

Tests 223, 238, 240, 247

OAEI 2008 Results (Anatomy)

Configuration

- Lexical similarity calculations excludes the ids (names) of entities.
- UMLS is used as the thesaurus.

Improvements

- The amount of memory required decreased from 3 GB to 597 MB.
- The time cost decreased from 15 hours to under 4 hours.

Issues

- Worse results than last year attributed partly to mishandling of multiple inheritance.
- Verification process is not bi-directional.
- Convergence.

System	Runtime	BK	Precision	Recall	Recall+	F-value
ASMOV			0.787	0.652	0.246	0.713
ASMOV-NV			0.716	0.680	0.289	0.697
ASMOV-NV-NP			0.861	0.343	0.115	0.490
ASMOV-REV			0.740	0.689	0.287	0.713

OAEI 2008 Results (Anatomy)

Tasks #2 & #3

- Threshold problem because of weight selection.

Task #4

- The partial reference alignment is used effectively by ASMOV since the overall accuracy increased in this task.

Task #2			Task #3			Task #4		
Prec	Rec	F-Measure	Prec	Rec	F-Measure	Prec	Rec	F-Measure
0.944	0.044	0.084	0.763	0.647	0.700	0.85	0.648	0.732

OAEI 2008 Results (FAO)

agrafsa & fishbio

- ASMOV is designed for OWL-DL and does not consider mapping between classes & individuals.

agrorgbio

- Because of a misunderstanding, the correspondences between individuals were excluded from the alignments submitted.

	agrafsa	agrorgbio	fishbio
submitted	1	0	5
<i>actual</i>	28	423	13

OAEI 2008 Results (Directory)

- The increase in precision is also tied to a major decrease in recall.
 - Weight issues.
 - Implementation errors.

2007			2008		
Prec	Rec	F-Measure	Prec	Rec	F-Measure
0.59	0.44	0.50	0.64	0.12	0.20

OAEI 2008 Results (Conference)

- 62 alignments evaluated (76 submitted)
 - Parser issue.
- Two evaluations
 - Manual labeling
 - The highest precision is achieved in the higher stratum
 - Reference Mappings:
 - Subsumption: naïve classification algorithm

P (0,0.3)	P(0.3,0.6)		P(0.6,1)		P*			rrecall	
21% +/- 12%	51% +/- 12%		68 +/- 12%		34% +/- 10%			18%	
ASMOV	66.2%	55.4%	60.4%	80.3%	26.6%	40.0%	91.9%	18.5%	30.8%
ASMOV*	70.8%	40.8%	51.7%	86.7%	21.2%	34.1%	92.6%	13.6%	23.7%
ASMOV (17-10-08)	44.2%	33.3%	38.0%	54.5%	10.5%	17.6%	100%	17.6%	6.8%

Observation & Future Work

- Weights
 - Re-adoption of last year's weight adjustment technique.
- The verification process rules are too strict
 - Bi-directional verification
 - The invalidation process should not reset the confidence values in the matrix.
- Convergence issue for large Ontologies



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