

Intro



Let a source ontology O_s , a target ontology O_T and a set of mappings M between O_s and O_T . Our framework takes as input a SPARQL query Q_s expressed over O_s , and rewrites it to a semantically correspondent SPARQL query Q_T (expressed over O_T) w.r.t. M.

SPARQL-RW: Transparent Query Access over Mapped RDF Data Sources Kostantinos Makris¹ · Nikos Bikakis^{2,3} · Nektarios Gioldasis¹ · Stavros Christodoulakis¹

	Mapping Mode	
Intro		Ov
 Ontole Define types query The su 	ibes mappings between OWL/RDF-S ogy schemas es and supports all the possible mappin which can be exploited by the SPARQL v rewriting process. upported mappings are highly ndent to the SPARQL expressiveness.	•
Gram	mar	
- Class - Obje - Data - Insta opera comp restria • Suppo equiva	basic notions: S Expression Expression atype Property Expression ance Expression ssions are defined using several ators: union (∐), intersection (∏), ossition (○), inverse (—), domain/range ctions, etc. orts N:M cardinality mappings using alence or subsumption relationships. ntics semantics based on Description Logics.	Ser Let the Def resu w.r. pres In o that proj
{ ?x "C}	ct?x dbpprop-el:óvoµa hristos Papadimitriou"}	Source Greek DBpedia
	L Queries Bpedia 3.2 Vocabulary	

¹ Technical University of Crete, Greece² National Technical University of Athens, Greece V

verview

The SPARQL query rewriting process lies in the query's graph pattern rewriting. For each Basic Graph Pattern, rewrite each triple pattern a) by Predicate b) by Object c) by Subject. The rewriting is independent of the query type (i.e., Select, Ask), the SPARQL solution sequence nodifiers (i.e., Order By, Distinct) and the SPARQL algebra operators (i.e., Union, Optional). riple Patterns Types

Data Triple Patterns: Deal with data and not schema info. – Schema Triple Patterns: Deal with schema info. Contain RDF/RDFS/OWL terms.

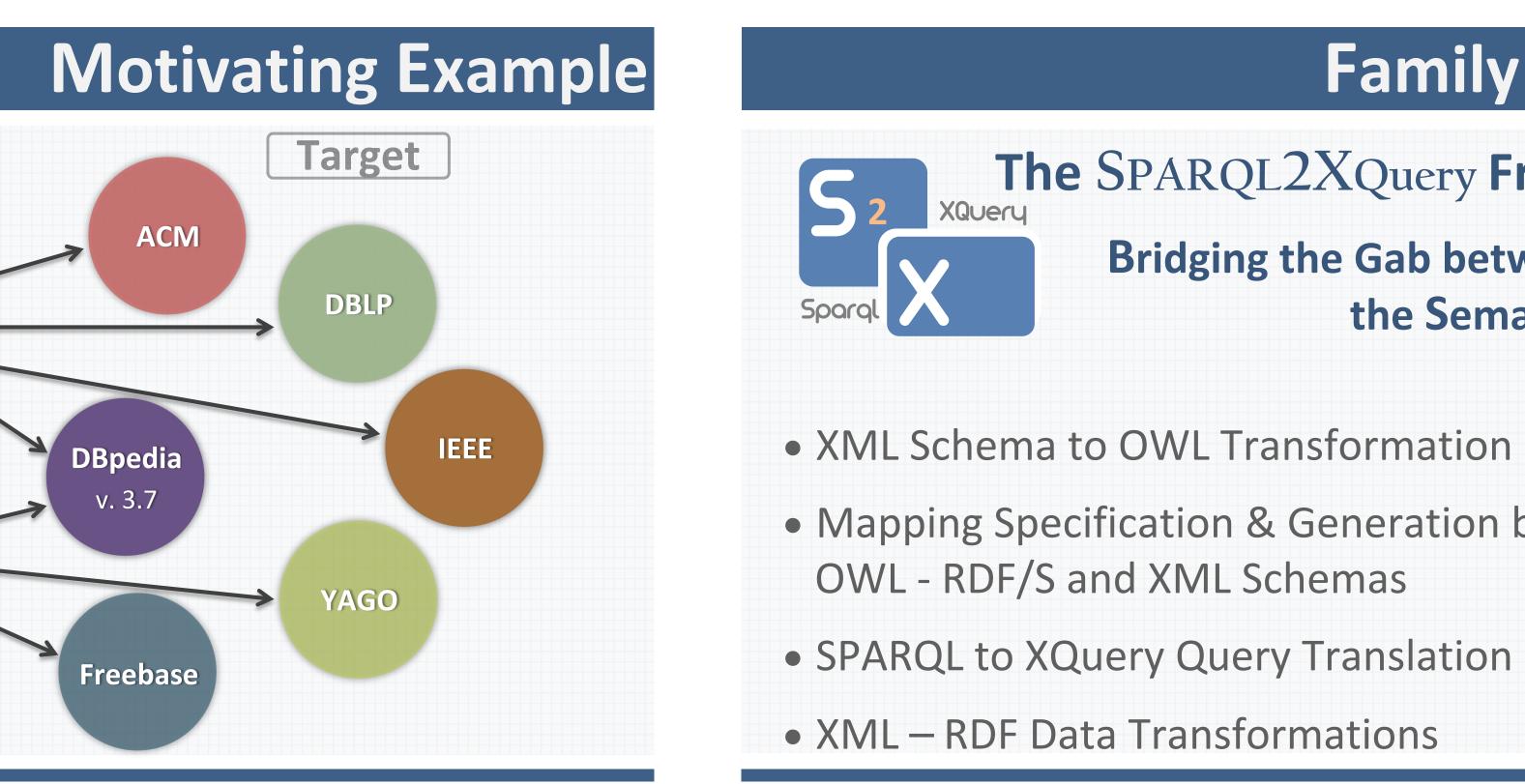


emantics Preserving Rewriting

 D_s and D_T be the RDF datasets of a source and a target ontology, respectively. Similarly, let D_U be RDF dataset which is produced by **merging** the D_s and D_T datasets using a set of mappings M.

finition (Semantics Preserving Rewriting). Let tp be a triple pattern and rp the graph pattern sulted from one step rewriting of tp w.r.t. a mapping $\mu \in \mathbf{M}$. The rewriting step performed for tp, t. the mapping μ , is semantics preserving iff the evaluation of tp and the evaluation of rp over D_{U} , eserve the semantics of mapping μ .

other words, let V be the common variable set between tp and rp. The relationship $\mathbf{R}(i.e., \equiv, \sqsubseteq, \supseteq)$ t holds for the mapping used in the rewriting step, should also hold between [[tp]]_{Du} and [[rp]]_{Du} ojected on \mathbf{V} .



 $\pi_{\mathrm{V}}([[tp]]_{\mathsf{D}\cup}) \mathbf{R} \pi_{\mathrm{V}}([[rp]]_{\mathsf{D}\cup})$, where $\mathbf{R} \in \{ \exists, \sqsubseteq, \supseteq \}$



Query ReWriting Subject Rewritten Triples by Mappings Subject Part (Final Triples)

Family Framework

The SPARQL2XQuery Framework

Bridging the Gab between the XML and the Semantic Web Worlds.

• XML Schema to OWL Transformation (XS2OWL plug-in)

Mapping Specification & Generation between