



SHELDON

Semantic Holistic framEwork for LinkeD ONtology data

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<http://wit.istc.cnr.it/stlab-tools/sheldon>

22 October 2014, Riva del Garda, Ita
ly



SHELDON

Powered by  ST LAB

Multilinguality:
SHELDON supports
47 languages

Type a text

Upload a document

Riva del Garda è una bellissima città che fa parte dell'Italia.

Machine Reading

Automatic understanding of text

Produce output as

HTML

56

Ba

Barium
137.327

247

Z

Zurium
300

53

I

Iodine
126.90447

7

N

Nitrogen
14.00674

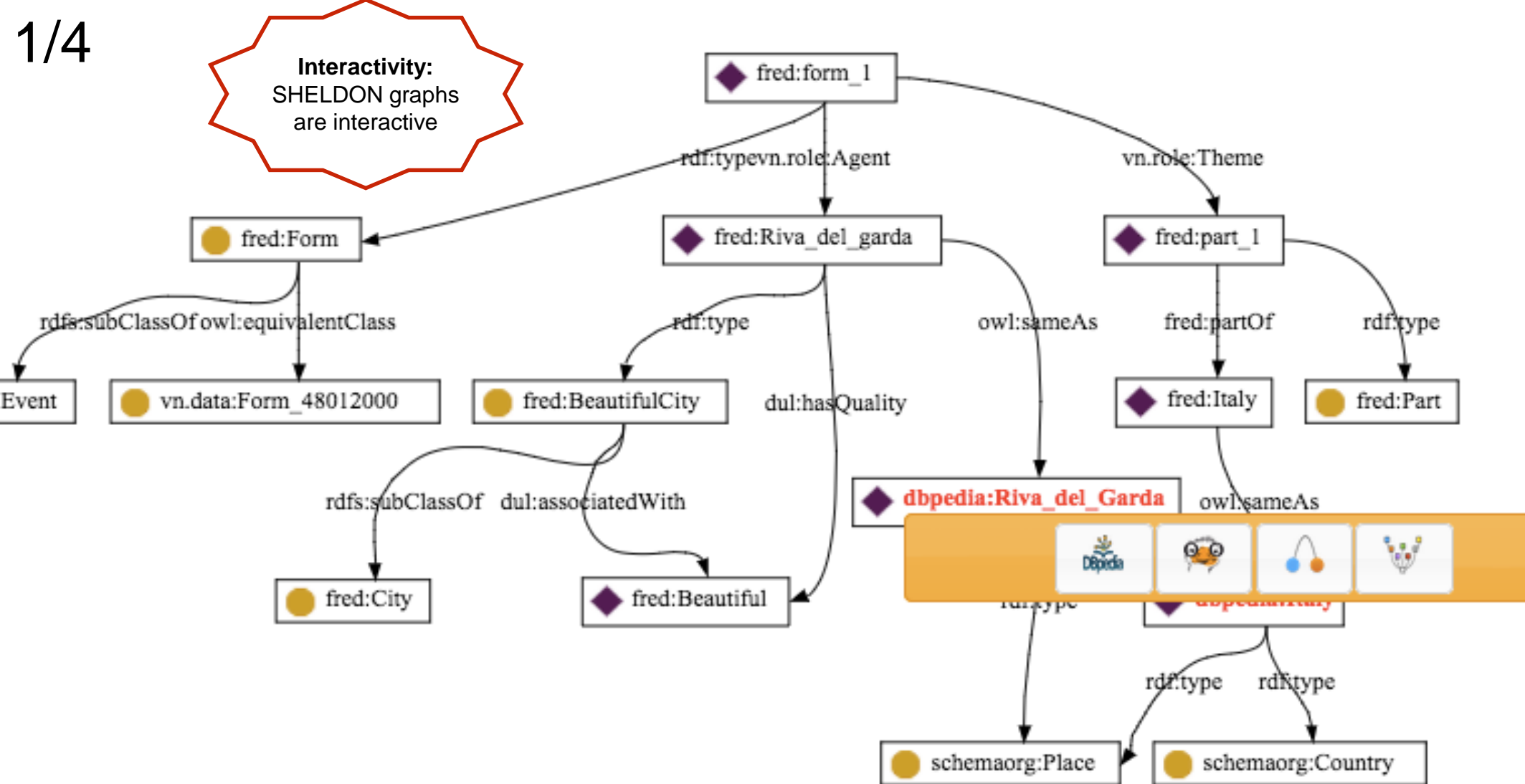
31

Ga

Gallium
69.723

Machine Reading examples:

- [Miles Davis was an american jazz musician. \(Fact\)](#)
- [A wind instrument is a musical instrument that contains some type of resonator. \(Definition\)](#)

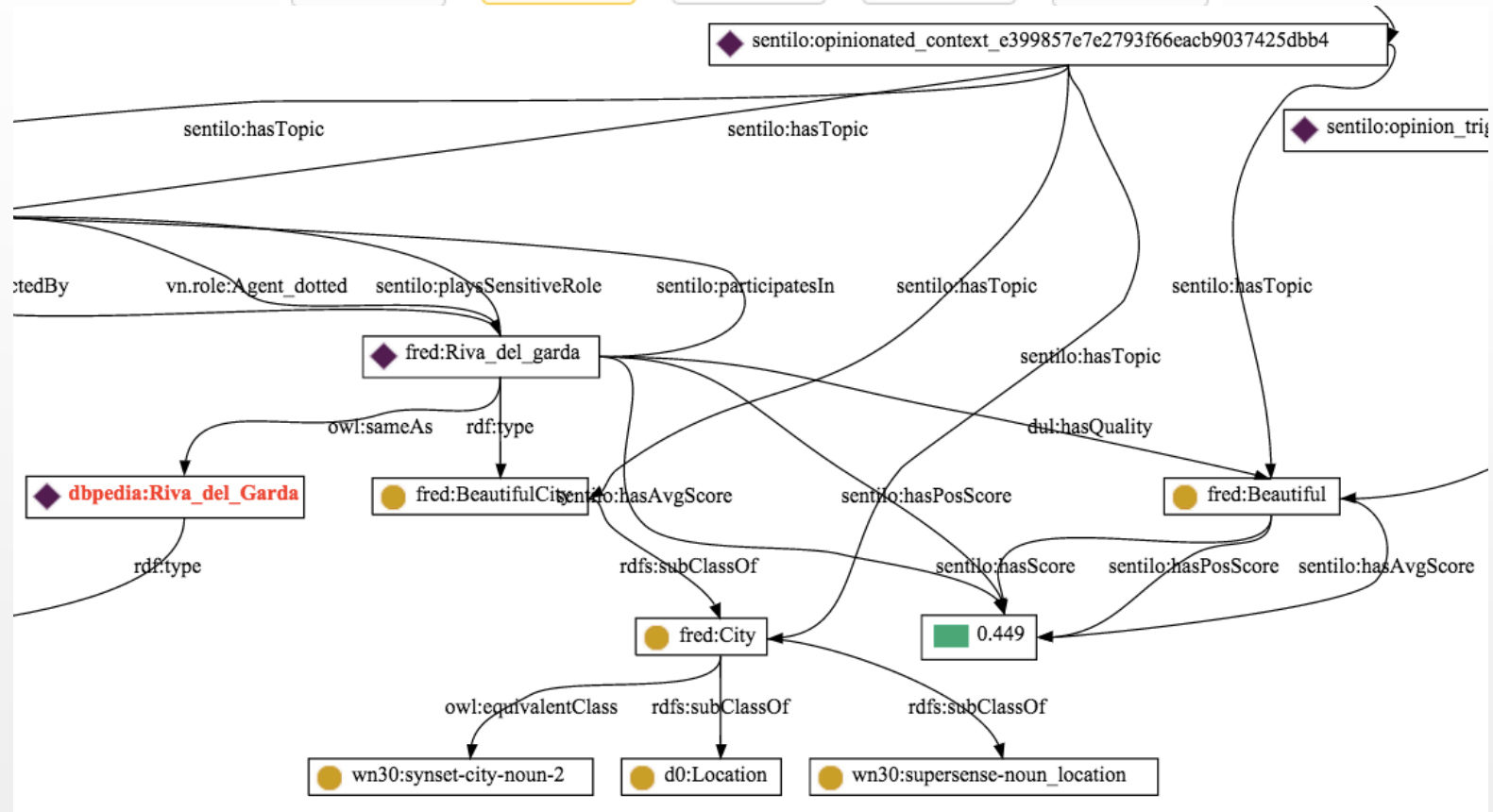


- Built on top of FRED, Boxer, C&C
- Use event detection, semantic role labeling, FrameNet roles, first-order logic representation of predicate-argument structures (DRT), logical operator scoping, modality detection, tense representation, NER with TAGME, WSD, DBPedia.

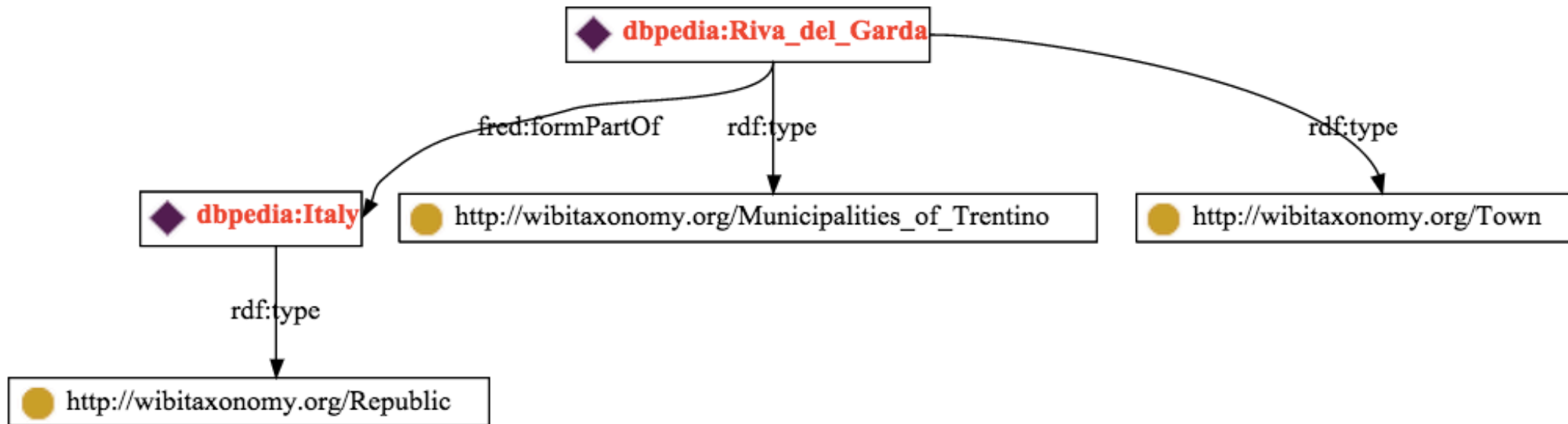
Semantic Sentiment Analysis

Automatic opinion data identification from text

HTML



- Use FRED, SentiWordNet, SenticNet, SentiloNet (new lexical resource we developed), OntoSentilo (new ontology for opinion sentences), WordNet, VerbNet, DBPedia.
- Holder detection, topic and subtopic detection, propagation towards entities and related nodes of the graph



- Binary relation discovery on FRED's graph among identified entities.
- Formalization of discovered properties in terms of domain and ranges (WIBI) and OWL2 property chains
- Built on top of FRED, DBPedia, WATSON API, WIBI



Type a text

Upload a document

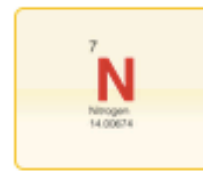
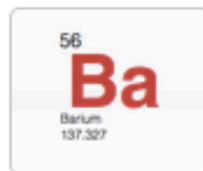
Riva del Garda è una bellissima città che fa parte dell'Italia.



Citation typing

Automatic identification of the nature of citations in scholarly text

Produce



The meaning of the citation can be expressed by the following CiTO properties:

- [cito:citesAsRecommendedReading](#)



DEMO



KNOWLEDGE EXPLORATION

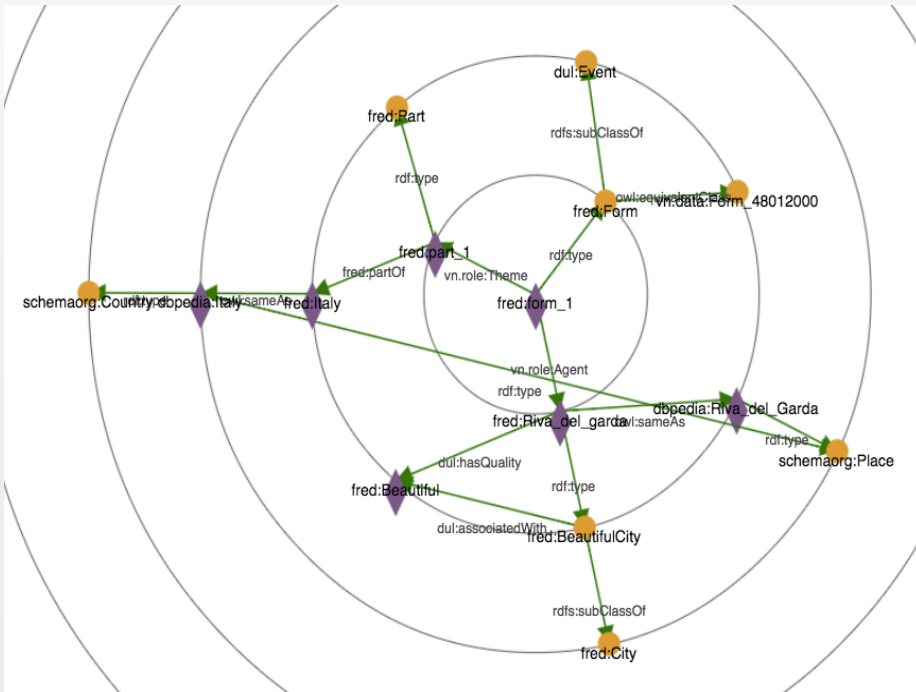
The screenshot shows the 'aemoo' website with a search bar and a network diagram titled 'Show Italy's curious links'. The diagram is a hub-and-spoke model with 'Italy' in the center. Spokes radiate outwards to various categories like 'University', 'Ethnic Group', 'Monarch', 'Country', 'Administrative Region', 'Language', 'World Heritage Site', 'Religion', 'Currency', 'City', 'Island', 'River', 'Military Unit', 'Office holder', and 'Legislature'. A sidebar on the left contains text about Italy and a list of universities.

The screenshot shows the Legato website interface. It includes a search bar with the text 'Type a Libpedia entry'. Below it, there's a list of names: 'Eugene', 'Alan Cross', 'Celine', 'Toshiko Akiyoshi', 'Walter McCarty', 'Amos and Barbara', 'Indira', and 'Albert Einstein Johnson'. A section titled 'Legato found 7 wikidata having dbpedia:Riva_del_Garda as subject.' lists several Wikidata entries with columns for Subject, Property, Object, Sentence, and a checkmark.

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:j.0="http://www.ontologydesignpatterns.org/ont/fred/domain.owl#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" >
  <rdf:Description rdf:about="http://dbpedia.org/resource/Riva_del_Garda">
    <rdfs:comment>Riva del Garda is a town and comune in the northern Italian province of Trento of the Trentino Alto Adige region.</rdfs:comment>
    <rdf:type rdf:resource="http://www.ontologydesignpatterns.org/ont/fred/domain.owl#TownAndComune" />
  </rdf:Description>
</rdf:RDF>
```



KNOWLEDGE VISUALIZATION



ReFinder

between examples

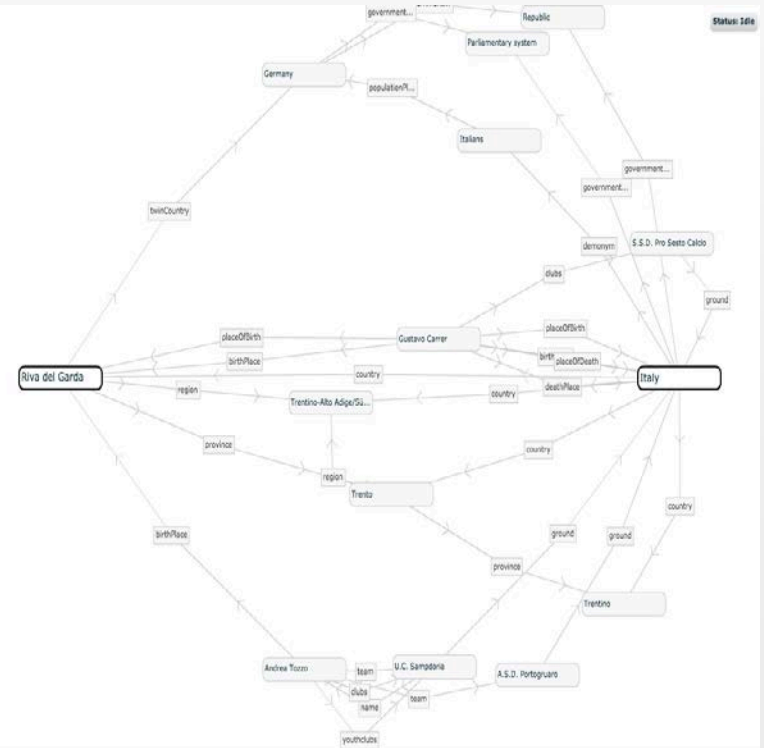
(1) Riva del Garda

(2) Italy

add clear Find Relations

Filter by: relations: (23/22)

length	class	link	connect...
Number of objects	num	vi	
0	1/1		
1	9/9		
2	12/12		



MARKET UPTAKE



Organizations using SHELDON

3CUBE S.R.L., SME, IT
Almaviva, SME, IT
ARTEMATICA IMPRESA DI COMUNICAZIONE MULTIMEDIALE S.R.L. , SME, IT
Caalma S.r.l. , SME, IT
CDB Agency s.r.l. , SME, IT
CNR sistemi informativi, research institution, IT
CUBECURVE S.R.L. , SME, IT
DR SOFT S.A.S. DI GRESTA MARIA CRISTINA & C. S.A.S. , SME, IT
ETNA HiTech, SME, IT
GEST S.R.L. , SME, IT
GRUPPO FOCUS S.R.L. , SME, IT
Hamatec S.r.l. , SME, IT
Hergaweb S.R.L. , SME, IT
HGO S.r.l. , SME, IT
HT S.r.l. , SME, IT
Impera Software S.R.L. , SME, IT
ITALDATA SOC. COOP a.r.l. , SME, IT
JOB CREATION S.R.L. , SME, IT
LIPN, Université Paris 13, research institution, FR
M.R.S. S.R.L. , SME, IT
P.M.F. S.r.l. , SME, IT
Red Link, SME, AUT
R2M Solution, SME, IT and UK
Semantic Sicily, consortium of Sicilian SMEs
Sentimetrix inc, SME, US
Sicula Ciclat Coop. , SME, IT
Signorelli & Partners S.a.s. , SME, IT
TECHMA - TECNOLOGIE MULTIMEDIALI AVANZATE S.R.L. , SME, IT
Tecnosys S.r.l. , SME, IT
Tesi Automazione S.R.L. , SME, IT
Uniroma 2, research institution, IT
University of Aberdeen, research institution, UK
University of Colorado, research institution, US
University of Bologna, research institution, IT
University of Catania, research institution, IT
University of Leeds, research institution, UK
Visual Software S.r.l. , SME, IT



20k accesss
per month

EU tender about fish ontologies and fishery label representation (to be started in November 2014) is going to use SHELDON to provide some of the proposed services.

New H2020 project about robot for assisted living (to be started in January 2015) is going to use SHELDON for the core engine of the robot automatic behaviour.

HERMES, an Italian industrial project is going to use SHELDON (several companies from LAZIO region) about travel planning (user profilation)

PRISMA, an Italian project is using SHELDON for sentiment analysis over data related to the city of Catania

SHELDON is going to be used in the creation of Apache Stanbol plugins, which is a product of a finished FP7 project called IKS



- SHELDON's team leverages expertise and skills of its members in start-up creation, management and sustainability.
- SHELDON represents the core service that a new UK start-up will provide to its customers.

Examples of real use case

PEOPLE INTERESTED IN SHELDON ASKED:

- Sentiment Analysis using semantics (<http://alt.qcri.org/semeval2015/task11/>)
- Access to the machine reading capabilities to exploit semantics for userclassification according to their text posted in social networks
- Access to relation discovery component and sentiment analysis to develop new components for CMS
- Access to the citation typing component for the digital library case study of CMS (potential collaboration with ELSEVIER)
- Use of SHELDON for the robot main component related to text understanding and interaction with humans

S TRENGTHS



- Expertise in start-up creation
- Each component successfully proved and published
- Wide ICT network in Europe
- Participation in H2020 project
- Competitors do different things
- Multi-language support for 47 languages
- Automatic language identification
- REST API Access

W EAKNESSES



- Initial funding
- Dedicated programmers
- Team not in the same physical place
- Computational time (hardware upgrade needed)

Internal factors

O PPORTUNITIES



- SHELDON is the first in its kind
- Provided semantics can be used in social networks, CMS, data analysis, system recommendation, etc.
- Semantics not really known yet
- 20k current access per month

T HREATS



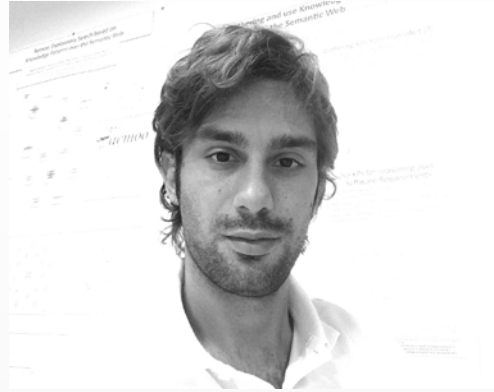
- License issues
- Security problems (REST API)

External factors

Positive

Negative





Thank you

