The SPAR Ontologies

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OA version of the conference paper:
https://doi.org/10.1007/978-3-030-00668-6_8
HTML: https://w3id.org/spar/article/spar-iswc2018/

These slides are available on Figshare
https://doi.org/10.6084/m9.figshare.7151759

The 17th International Semantic Web Conference
8-12 October 2018, Monterey, CA, USA

OpenCitations

DIPARTIMENTO DI FILOLOGIA CLASSICA E ITALIANISTICA

Towards a new model for scholarly publishing

Semantic Publishing: the use of Web and Semantic Web technologies and standards for **enhancing a scholarly work semantically** (by means of plain RDF statements, nano-publications, etc.) so as to improve its **discoverability**, **interactivity**, **openness** and **(re-)usability** for both humans and machines

Who is involved:

- Publishers – e.g. Springer Nature (SciGraph) and Elsevier (Grand Challenge)
- Academic communities – e.g. FORCE11 (FAIR) and Linked Research
- Other institutions – e.g. Wikimedia (in particular Wikidata / WikiCite)

Our contribution to Semantic Publishing

Our goal (since 2010): development of a **set of complementary and orthogonal ontologies** that can be used for the description of the main areas of this publishing domain, from the metadata of scholarly artefacts to the specification of the workflow processes that result in the publication of a scholarly bibliographic product

SPAR (Semantic Publishing and Referencing) Ontologies
http://www.sparontologies.net – @sparontologies

- Available with a Creative Commons Attribution License 4.0
- Short descriptive page on the SPAR website, Graffoo diagrams, examples of usage in Turtle, publication information, HTML documentation
- Included in LOV – http://lov.okfn.org/dataset/lov/vocabs?tag=SPAR

Development principles (DPs)

DP1 - Enabling adoption: addressing actors' requirements
Involve authors, editors, publishers, members of academic communities, etc., their needs, and the vocabularies they use in their day-to-day work for referring to publishing things

DP2 - Enabling reuse: interoperable ontological modules
Complementary ontological blocks, each describing a particular aspect of the publishing domain, which could be combined easily or used alone to meet the actual description needs

DP3 - Enabling application in different contexts: minimal logical constraints
Use only a very limited number of strictly necessary constraints that allow a respectable level of formal verification of data, while enabling their easy learning and re-use in different contexts

DP4 - Enabling interoperability: reusing existing vocabularies
Include of concepts from existing vocabularies / design patterns, since they can provide an initial more general stub and can speed the adopters' learning curve for understanding the new model

Main tools developed

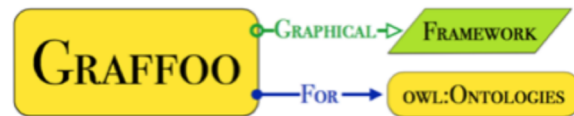DP5 - Enabling human understandability: supporting people with examples and tools

Provide mechanisms for understanding and accessing the ontology by people who may not necessarily be experts in Knowledge Representation

SAMOD

http://www.essepuntato.it/lode

http://www.essepuntato.it/samod

http://www.essepuntato.it/graffoo

SPAR Ontologies: a diagram

17 OWL 2 DL ontologies

Reuse of several existing models and design patterns

components involved in the citation process

specification of qualitative and quantitative evaluations of a bibliographic resource or an agent (impact factor, h-index, e-index, etc.) and for the encoding of a Five Stars rating for articles

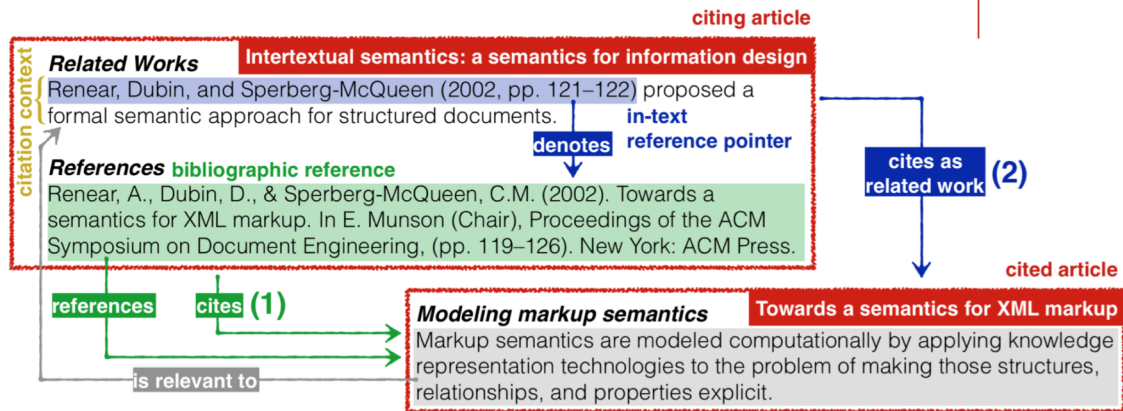|					Legend
SPAR Ontologies	SWAN Ontology modules	Ontology Design Patterns	Other external ontologies		
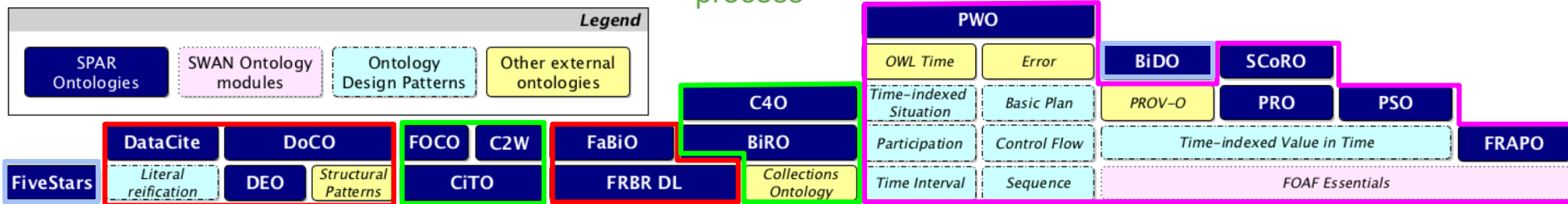
bibliographic resources, their identifiers, and their internal components (paragraphs, sections, results, methods, etc.)
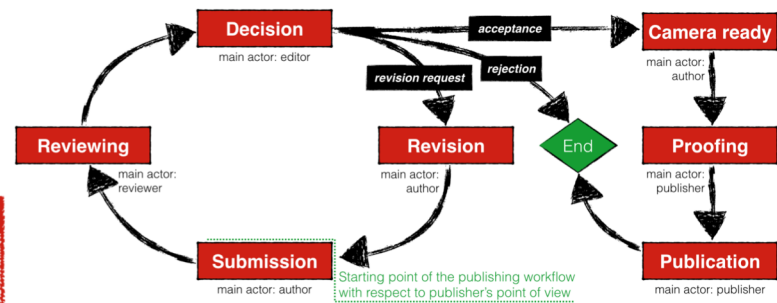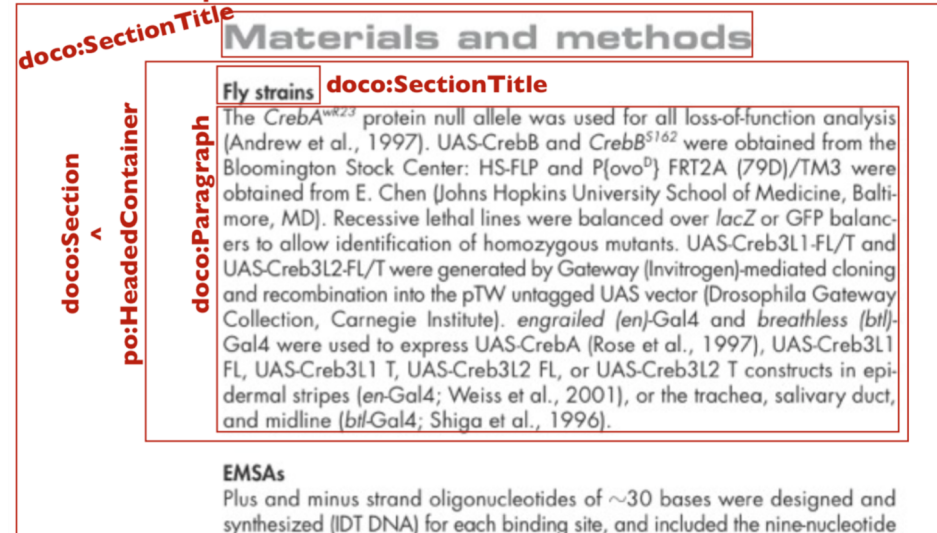
contextual aspects of a publication, namely agents' roles, document statuses, steps in the publishing workflow, contributors' roles, and related academic administrative information

Giving names to things

Disambiguating words (e.g. "reference") by providing specific terms to each part of an article ("citing entity", "cited entity", "citation", "reference", "bibliographic reference", …)

doco:Section ^ po:HeadedContainer ^ deo:Methods ^ deo:Materials

doco:SectionTitle

Materials and methods

Fly strains   doco:SectionTitle

The CrebA^{wR23} protein null allele was used for all loss-of-function analysis (Andrew et al., 1997). UAS-CrebB and CrebB^{S162} were obtained from the Bloomington Stock Center: HS-FLP and P{ovo^D} FRT2A (79D)/TM3 were obtained from E. Chen (Johns Hopkins University School of Medicine, Baltimore, MD). Recessive lethal lines were balanced over lacZ or GFP balancers to allow identification of homozygous mutants. UAS-Creb3L1-FL/T and UAS-Creb3L2-FL/T were generated by Gateway (Invitrogen)-mediated cloning and recombination into the pTW untagged UAS vector (Drosophila Gateway Collection, Carnegie Institute). engrailed (en)-Gal4 and breathless (btl)-Gal4 were used to express UAS-CrebA (Rose et al., 1997), UAS-Creb3L1 FL, UAS-Creb3L1 T, UAS-Creb3L2 FL, or UAS-Creb3L2 T constructs in epidermal stripes (en-Gal4; Weiss et al., 2001), or the trachea, salivary duct, and midline (btl-Gal4; Shiga et al., 1996).

EMSAs
Plus and minus strand oligonucleotides of ~30 bases were designed and synthesized (IDT DNA) for each binding site, and included the nine-nucleotide

doco:Section ^ po:HeadedContainer
doco:Paragraph

citing article

Related Works   Intertextual semantics: a semantics for information design
Renear, Dubin, and Sperberg-McQueen (2002, pp. 121–122) proposed a formal semantic approach for structured documents.   **in-text reference pointer**
denotes

References   bibliographic reference
Renear, A., Dubin, D., & Sperberg-McQueen, C.M. (2002). Towards a semantics for XML markup. In E. Munson (Chair), Proceedings of the ACM Symposium on Document Engineering, (pp. 119–126). New York: ACM Press.

citation context

references   cites (1)

cites as related work (2)

cited article

Modeling markup semantics   Towards a semantics for XML markup
Markup semantics are modeled computationally by applying knowledge representation technologies to the problem of making those structures, relationships, and properties explicit.

is relevant to

An example (in Turtle)

```
<https://w3id.org/oc/corpus/br/1>
    a fabio:Expression, fabio:JournalArticle ;
    prism:publicationDate "2016"^^xsd:gYear ;
    dcterms:title "ESMO-ESGO-ESTRO Consensus Conference on Endometrial Cancer" ;
    fabio:hasSubtitle "Diagnosis, Treatment and Follow-up" ;
    cito:cites
        <https://w3id.org/oc/corpus/br/10>,
        <https://w3id.org/oc/corpus/br/100>,
        ... ;
    datacite:hasIdentifier
        <https://w3id.org/oc/corpus/id/1>,
        ... ;
    pro:isDocumentContextFor
        <https://w3id.org/oc/corpus/ar/1>,
        ... ;
    frbr:partOf <https://w3id.org/oc/corpus/br/2> ;
    frbr:embodiment <https://w3id.org/oc/corpus/re/1> .

<https://w3id.org/oc/corpus/re/1> a fabio:Manifestation ;
    prism:endingPage "30" ;
    prism:startingPage "2" .


<https://w3id.org/oc/corpus/id/1> a datacite:Identifier ;
    datacite:usesIdentifierScheme datacite:doi ;
    literal:hasLiteralValue "10.1097/igc.0000000000000609" .


<https://w3id.org/oc/corpus/ar/1> a pro:RoleInTime ;
    pro:isHeldBy <https://w3id.org/oc/corpus/ra/1> ;
    pro:withRole pro:author ;
    oco:hasNext <https://w3id.org/oc/corpus/ar/2> .


<https://w3id.org/oc/corpus/ra/1> a foaf:Agent ;
    foaf:familyName "Colombo" ;
    foaf:givenName "Nicoletta" .
```

Who is using SPAR

VIVO connect share discover

United Nations System CEB
Chief Executives Board for Coordination

HIGH-LEVEL COMMITTEE ON MANAGEMENT (HLCM)

Working Group on Document Standards

The United Nations System Document Ontology

A framework for the description of United Nations system documents' entities and their relationships

Zeri&LODE
The Zeri Photo Archive to Linked Open Data

citeulike

PubChem

dokieli

WIKIDATA

ScholarlyData

GlobalChange.gov
U.S. Global Change Research Program

Global Change Information System

Complete list at http://www.sparontologies.net/uptake

Statistics

677 articles (source Google Scholar, 20 March 2018) refer to SPAR Ontologies – complete list at http://www.sparontologies.net/publications
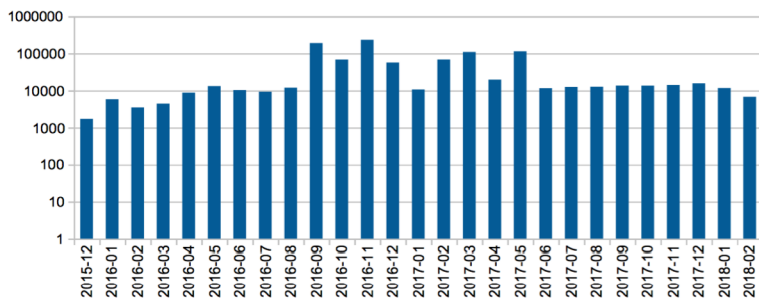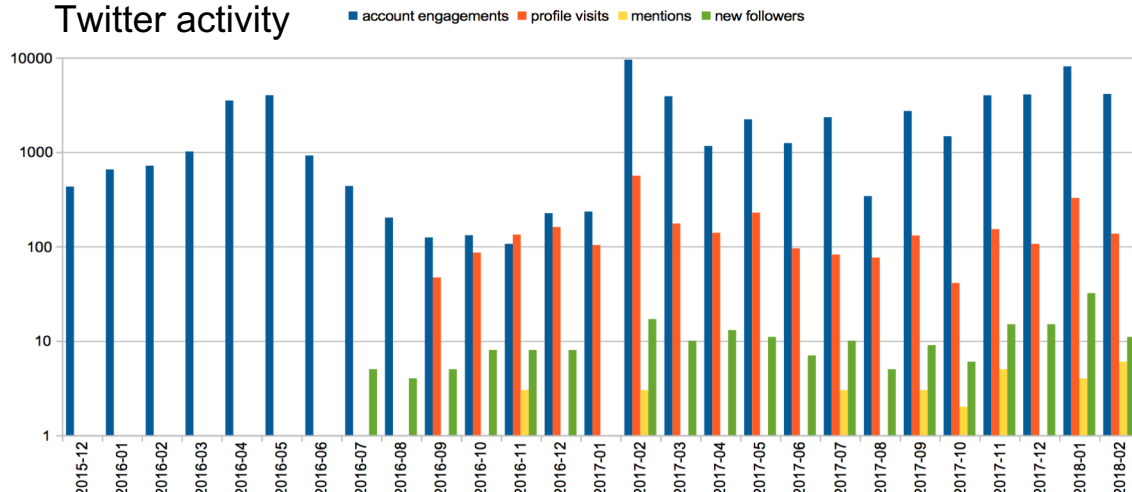
Figshare resources

Website accesses
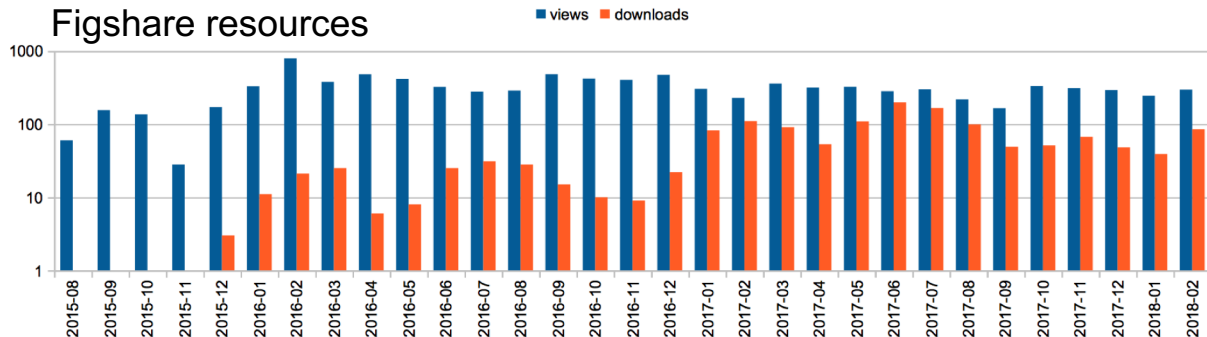
Twitter activity

Sustainability in the long term: OpenCitations

OpenCitations (http://opencitations.net) is a scholarly infrastructure organization

- dedicated to **open scholarship** and the **publication of open bibliographic and citation data** by the use of Semantic Web technologies
- engaged in advocacy for **open citations**

It sustains and uses SPAR Ontologies for describing the bibliographic and citation datasets it releases to the public (i.e. the OpenCitations Corpus and COCI)

SPAR Ontologies were one of the main outcomes – full details in the official blog – of an original JISC-funded project (2010) which aimed at publishing open bibliographic citation information in RDF and making citation links as easy to traverse as Web links (i.e. the JISC Open Citations Project)

One more thing

SPAR Ontologies resources have recently been migrated from Sourceforge to GitHub – https://github.com/sparontologies

New contribution guidelines, available at https://sparontologies.github.io, permit members of the community to propose new ontologies to be added to the SPAR ontologies suite

Newest member of the SPAR suite...

http://purl.org/spar/fr

Conclusions

The SPAR Ontologies are set of complementary and orthogonal ontologies that can be used for the description of the main areas of this publishing domain

Used in different projects and by different institutions

Possibility to extend the suite by accepting proposals of new ontologies from the community

Future works: to develop tools that authors and publishers can use for the (semi-)automatic production of SPAR-based metadata

Thank you for your attention

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