

django-rdfliib e PostgreSQL il meglio dei due mondi

Ştefan Talpalaru <http://od-eon.com/blogs/stefan/>

- uso Python/Django da 3 anni
- Linux dal secolo scorso
- utente Gentoo dal primo contatto
- Fondatore e CTO di Odeon Consulting Group Pte Ltd

- RDF
- ricerca full-text
- django-fts-odeon
- django-rdfliib
- BAMS

RDF

divide et impera

la tripla:
soggetto - predicato - oggetto

l'abbreviazione di "terminal nerve" nella nomenclatura Swanson 2004 per ratto è 'tn'

"terminal nerve" - "nomenclature" - "Swanson 2004"

"terminal nerve" - "species" - "ratto"

"terminal nerve" - "abbreviation" - "tn"

"terminal nerve" - "abbreviation" - "tn"

http://brancusi1.usc.edu/brain_parts/terminal-nerve-3/

<http://brancusi1.usc.edu/RDF/abbreviation/>

i namespace sono zucchero sintattico
bams = <http://brancusi1.usc.edu/RDF/>
bams:abbreviation

http://brancusi1.usc.edu/brain_parts/terminal-nerve-3/
<http://brancusi1.usc.edu/RDF/abbreviation/>
"tn"

modello semplice, sistemi di stoccaggio
semplici - triplestores

il quad:
soggetto - predicato - oggetto - contesto

grafi etichettati - isolare una parte dei dati

ulteriori complicazioni col stoccaggio

ottimizzare le operazioni più frequente (come cercare i soggetti con un certo `rdf:type`)

indicizzare i singoli elementi e le coppie
(per velocizzare le ricerche)

Full-text search

perché confrontare le stringhe non basta

stemming -> stem

algoritmi di stemming

PostgreSQL

la versione Snowball dell'algoritmo di Porter

dizionari ortografici

Ispell, Hunspell

thesaurus - rimpiazzare frasi con parole

ordine flessibile dei termini di ricerca

bar foo
foo bar

ordinamento per rilevanza

evidenziare i risultati

django-fts-odeon

fork di django-fts

ci interessa soltanto il back-end postgresql

una migliore integrazione con Django

- manager personalizzato - i metodi fts ora sopravvivono al concatenamento
- comando di management per l'aggiornamento degli indici

la capacità di evidenziare i risultati

```
from django.db import models
import fts

class Literals(fts.SearchableModel):
    lexical = models.TextField()
    search_objects =
fts.SearchManager(fields=('lexical',))
```

```
Literals.search_objects.search('foo bar',  
rank_field='rank')
```

django-rdfliib

- libreria in Python al 100%
- da mettere in un repository git - funziona su configurazioni varie

dipendenze:

- Django
- PostgreSQL
- South
- pyparsing per il parser SPARQL
- django-fts-odeon

fork di rdflib

rdflib sembrava non mantenuto, a quel
tempo

gli sviluppatori hanno cominciato a
rimuovere funzioni, invece di risolvere i
problemi

prima sono venuti per SPARQL (ora in una libreria chiamata "rdfextras")

poi sono venuti per la maggior parte dei
storage back-ends
(compresi MySQL e PostgreSQL)

perchè usarla?

API di ricerca in python

non ci sono alternative migliori

più facile riparare/migliorare che riscrivere

integrazione con Django

la parte facile: riutilizzare la connessione al
database

```
from rdflib.store.MySQL import SQL
from django.db import connection,
transaction

class PostgreSQL(SQL):
    ...
    def _connect(self, db=None):
        return connection

    def commit(self):
transaction.commit_unless_managed()

    def rollback(self):
transaction.rollback_unless_managed()
```

la parte interessante:

- usare una migrazione South per creare le tabelle
- creare i modelli (non gestiti) per le tabelle di rdflib

```
from rdflib.term import Literal, URIRef,
BNode, Variable
from django_rdflib.utils import
get_rdflib_store_graph
store, graph = get_rdflib_store_graph()
```

```
triple1 = (URIRef('http://foo.com/subject1'),  
URIRef('http://bar.com/pred1'),  
Literal('obj1'))  
triple2 = (URIRef('http://foo.com/subject2'),  
URIRef('http://bar.com/pred2'),  
Literal('obj2'))  
graph.add(triple1)  
graph.add(triple2)  
graph.commit()
```



```
quad1 = (URIRef('http://foo.com/subject1'),  
None, None, None )  
quad2 = (URIRef('http://foo.com/subject2'),  
None, None, None )  
graph.removeN([quad1, quad2])
```

```
lit_str = """foo  
Bar"""
```

```
q = """  
SELECT ?s ?p WHERE {  
  ?s ?p \"""%s\""" .  
}  
""" % (lit_str, )
```

```
for (s, p) in graph.query(q):  
    pprint((s, p))
```

BAMS - [brancusi1.usc.edu](mailto:brancusi1@usc.edu)

Brain Architecture Management System

Mihail Bota - Associate Professor (Research)
of Biological Sciences, University of
Southern California

raccolta di dati neurobiologici da pubblicazioni scientifiche

PHP/MySQL -> Python/Django/PostgreSQL/RDF

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Nervous system parts

[Thesaurus](#)

Nervous system part:



Species:

-- any --



Nomenclature:

-- any --



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Nervous system parts | Thesaurus

Matches by: **Name (6)** | Description (0) | Abbreviation (0)

Displaying 1 - 6 out of 6 results for: "terminal nerve"

[Do another search](#)

NERVOUS SYSTEM PART (ABBREVIATION)	TYPE	NOMENCLATURE	SPECIES	GENERAL DESCRIPTION	COLLATOR	BAMS ASSOCIATED INFORMATION
Terminal Nerve (tn)	fiber tract	Swanson-1992	Rat	According to Bojsen-Moller 1975, Schwanzel-Fukuda et al. 1985, Demski and Schwanzel-Fukuda 1987.	Mihail Bota	Associated info
Terminal Nerve (tn)	fiber tract	Swanson-1998	Rat	According to Bojsen-Moller 1975, Schwanzel-Fukuda et al. 1985, Demski and Schwanzel-Fukuda 1987.	Mihail Bota	Associated info
Terminal Nerve (tn)	fiber tract	Dong-2007	Mouse	No description provided.	Mihail Bota	Associated info
Terminal Nerve (tn)	fiber tract	Swanson-2004	Rat	According to Bojsen-Moller 1975, Schwanzel-Fukuda et al. 1985, Demski and Schwanzel-Fukuda 1987.	Mihail Bota	Associated info
Terminal Nerve (trn)	fiber tract	Bowden-Macaca-2002	Macaca fascicularis	No description provided. The original URL is provided:	Mihail Bota	Associated info
Terminal Nerve (trn)	fiber tract	Bowden-Human-2002	Human	No description provided. The original URL is provided:	Mihail Bota	Associated info

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Brain part

Terminal Nerve

Hierarchy level in atlas is 4: 3 superstructures include it.

abbreviation: tn

- ▶ Details ?
- ▶ Same term found in other nomenclatures ?
- ▼ Tree of Terminal Nerve ?

Central Nervous System

- Central nervous system white matter
 - Lateral forebrain bundle system
 - Extrapyramidal fiber systems
 - Medial forebrain bundle system
- Cranial Nerves, Spinal Nerves, and Related
 - vagus nerve
 - glossopharyngeal nerve
 - Vestibulocochlear nerve
 - facial nerve
 - dorsal roots

Edit "Brain Part" object**Fields added by BAMS Administrators**

Name: *	<input type="text" value="Cortex Stefan"/>
Abbreviation:	<input type="text"/>
Collation Date:	<input type="text"/>
Collator Argument:	<input type="text" value="0"/>
Collator Involvement:	<input type="text" value="-----Select-----"/>
Description:	<input type="text" value="Test Brain Part for workspace demo"/>
Endorsed:	<input type="checkbox"/>
Extra Info:	<input type="text"/>
Gross Constituent:	<input type="text" value="-----Select-----"/>
Nomenclature:	<input type="text" value="-----Select-----"/>
Old_id:	<input type="text"/>
Reference:	<input type="text" value="-----Select-----"/> + Add New
Species:	<input type="text" value="-----Select-----"/>
Thesaurus:	<input type="text" value="-----Select-----"/> + Add New

Actions

[new "Brain Part" object](#)

[delete "Brain Part" object](#)

[add new field](#)

[predicates list](#)

RDF representation

[Cortex-Stefan](#) - rdf:type - <http://brancusi1.usc.edu/RDF/brainPart>
Link

[Cortex-Stefan](#) - bams:name - Cortex Stefan
Link

[Cortex-Stefan](#) - bams:workspace - 1
Link

[Cortex-Stefan](#) - bams:collatorArgument - 0
Link

[Cortex-Stefan](#) - bams:description - Test Brain Part for workspace demo
Link

[Cortex-Stefan](#) - bams:endorsed - False
Link

Actions

new "Brain Part" object
delete "Brain Part" object
add new field
predicates list

RDF representation

Cortex-Stefan - rdf:type -
<http://brancusi1.usc.edu/RDF/brainPart>
Link

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[Brain Part](#) > [Cortex-Stefan](#)

Add New Field to Cortex-Stefan

Name: *

Value type: *

Value: *

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Foundational Model of Connectivity (Swanson & Bota, 2010)

Nervous system parts

Thesaurus

Matches by: Entry (0)

Abbreviation (0)

Reference (0)

Definition (14)

Displaying 1 - 10 out of 14 term results for: "complete"

[« previous](#) 1 **2** [next »](#)
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ENTRY (ABBREVIATION)	REFERENCE	DEFINITION
Connectome	Bota and Swanson, 2010	For the Foundational Model of Connectivity , the complete structural connection matrix of nodes forming the nervous system (Monro, 1783) of ... show more
Neural Network		The structural arrangement of all neurons (Waldeyer, 1891) and their connections in a nervous system (Monro, 1783) . A neural network ... show more
Topographic Description Of Body	Swanson & Bota, 2010	One of two common orthogonal ways of describing completely the body ; the other is the systems description of body . Topography ... show more
Systems Description Of Body	Swanson & Bota, 2010	One of two common orthogonal ways of describing completely the body ; the other is the topographic description of body . An ... show more
Circuitry		A vague term referring to all or part of the connectome or complete wiring diagram ; it should be avoided, see ... show more
Neural Subnetwork		An arbitrary subset of a complete neural network , often distinguished on functional grounds. A closely related term is neural subsystem .
Neural Subsystem		A subset of the complete nervous system (Monro, 1783) defined on functional grounds; for example, the visual system or the ... show more

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Nervous system parts | **Thesaurus**

Matches by: [Entry \(0\)](#) | [Abbreviation \(0\)](#) | [Reference \(0\)](#) | **[Definition \(1\)](#)**

Displaying 1 - 1 out of 1 term result for: "**nucleus lateral**"

[Do another search](#)

ENTRY (ABBREVIATION)	REFERENCE	DEFINITION
Gray Matter Nucleus		<p>A term applied to many gray matter regions in the cerebrospinal axis (Meckel, 1817), usually though not always (e.g., the human dorsal lateral geniculate nucleus) when they have relatively clear borders and are nonlaminated. The first use of the term in this way was by Ludwig (1779, Fig. 2b, p. 36); the cell nucleus, a cytological feature, was named by Brown (1833, p. 710). show less</p>

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RDF serialization

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Documentation

General structure

The XML document is a serialization of RDF triples that describe two types of data: a hierarchical structure expressed using the "OWL DL 2" standard, and additional information about the classes and instances in that hierarchy.

The root tag of the document contains a list of namespace prefixes and their aliases, followed by tags describing unique RDF subjects (in the form of alphanumeric IDs if they are blank nodes, or URIs).

```
</rdf:Description>
<rdf:Description rdf:about="http://brancusi1.usc.edu/brain_parts/terminal-ganglion/">
  <rdf:type rdf:resource="http://brancusi1.usc.edu/RDF/brainPart"/>
  <bams:abbreviation>GTE</bams:abbreviation>
  <bams:collationDate>2004-04-15</bams:collationDate>
  <bams:collator>476</bams:collator>
  <bams:description>No description provided</bams:description>
  <bams:grossConstituent rdf:resource="http://brancusi1.usc.edu/RDF/grayMatter"/>
  <bams:name>terminal ganglion</bams:name>
  <bams:nomenclature rdf:resource="http://brancusi1.usc.edu/rdf/nomenclature/Swanson-2004"/>
  <bams:reference rdf:nodeID="auBw0opM362"/>
  <bams:species rdf:resource="http://brancusi1.usc.edu/RDF/rat"/>
  <bams:workspace>0</bams:workspace>
</rdf:Description>
<rdf:Description rdf:about="http://brancusi1.usc.edu/brain_parts/terminal-nerve-3/">
  <rdf:type rdf:resource="http://brancusi1.usc.edu/RDF/brainPart"/>
  <bams:abbreviation>tn</bams:abbreviation>
  <bams:collationDate>2004-11-04</bams:collationDate>
  <bams:collator>476</bams:collator>
  <bams:description>According to Bojsen-Moller 1975, Schwanzel-Fukuda et al. 1985, Demski and Schwanzel-Fukuda 1987.</bams:description>
  <bams:grossConstituent rdf:resource="http://brancusi1.usc.edu/RDF/fiberTract"/>
  <bams:name>terminal nerve</bams:name>
  <bams:nomenclature rdf:resource="http://brancusi1.usc.edu/rdf/nomenclature/Swanson-2004"/>
  <bams:reference rdf:nodeID="auBw0opM362"/>
  <bams:species rdf:resource="http://brancusi1.usc.edu/RDF/rat"/>
  <bams:workspace>0</bams:workspace>
</rdf:Description>
<rdf:Description rdf:about="http://brancusi1.usc.edu/brain_parts/thalamic-peduncles/">
/src/77_DLD/bams_ontology_2011-06-20_08-02-50.xml [xml] [line:128922 col:0001] [62%] [lines:206714]
"bams_ontology_2011-06-20_08-02-50.xml" 206714L, 14741010C
```




domande?

<https://github.com/odeoncg/django-fts-odeon>
<https://github.com/odeoncg/django-rdfliib>