

OntoCAT — a simpler way to access ontology resources

Tomasz Adamusiak, Tony Burdett, K Joeri van der Velde, Niran Abeygunawardena, Despoina Antonakaki, Helen Parkinson, Morris A. Swertz

European Bioinformatics Institute, Cambridge, UK
Genomics Coordination Center, University Medical Center & University of Groningen, NL

Why yet another framework?

- Simple core of common ontology services
- Community platform for sharing ontology tools and applications
- Uniform interface to query local ontologies in OWL or OBO and public ontology repositories: BioPortal and OLS

Features

- Designed for ontology-driven applications
- Open source released under LGPLv3 license
- Cached results are returned much quicker
- Queries can be run in parallel to speed up searches even more

	OLS	BioPortal	Swoogle	OntoCAT
Web services	SOAP	REST	REST	REST
Java API	Yes			Yes
Complexity (C)	16	31	19	13
Richness (R)	170	1363	1403	≥ 1533
log R/C	1.0	1.6	1.9	2.1+
OWL support		Yes	Yes	Yes
OBO support	Yes	Yes		Yes
Local ontologies				Yes
Open source	Apache License	Apache License		LGPL v.3

Comparison of available features between existing ontology resources

Common workflow to integrate ontology resources

Ontology	
getOntologies()	lists all ontologies available through a service
getOntology()	returns an <i>Ontology</i> object
Term	
searchAll()	lists <i>OntologyTerm</i> objects matching keywords
searchOntology()	searches a single ontology
getTerm()	returns an <i>OntologyTerm</i> object
getAnnotations()	returns all additional annotations on a term
getSynonyms()	lists synonyms of a term (if available)
getDefinitions()	lists definitions of a term (if available)
Hierarchy	
getRootTerms()	lists all root terms in an ontology
getTermPath()	returns first path to ontology root
getChildren()	returns immediate children of a term
getParents()	returns immediate parents of a term
getRelations()	lists term relations, e.g. partOf, derivesFrom

OntoCAT's common *OntologyService* interface implemented for local ontologies in OWL and OBO as well as for public ontology resources: BioPortal and OLS

```
// Instantiate a composite service
OntologyService os = CompositeDecorator.getService(
    new BioportalOntologyService(),
    new OlsOntologyService(),
    new FileOntologyService(
        new URI("http://www.ebi.ac.uk/efo/efo.owl")
    )
);

// Query all ontology resources in one uniform call
List<OntologyTerm> result = os.searchAll("thymus")
```

Code example

Zooma

— an ontology mapping application designed to find optimal matches between text values and ontology terms

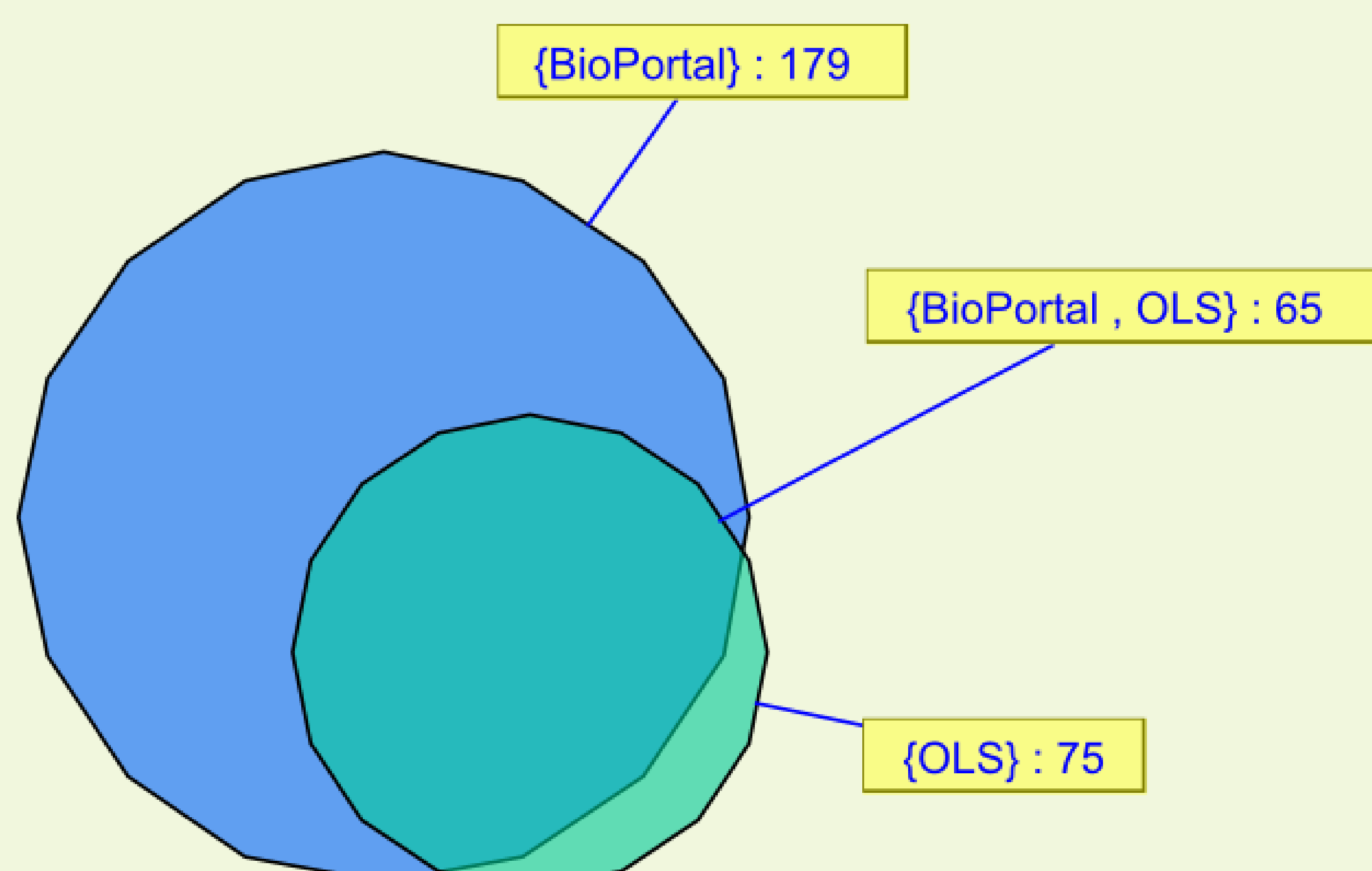
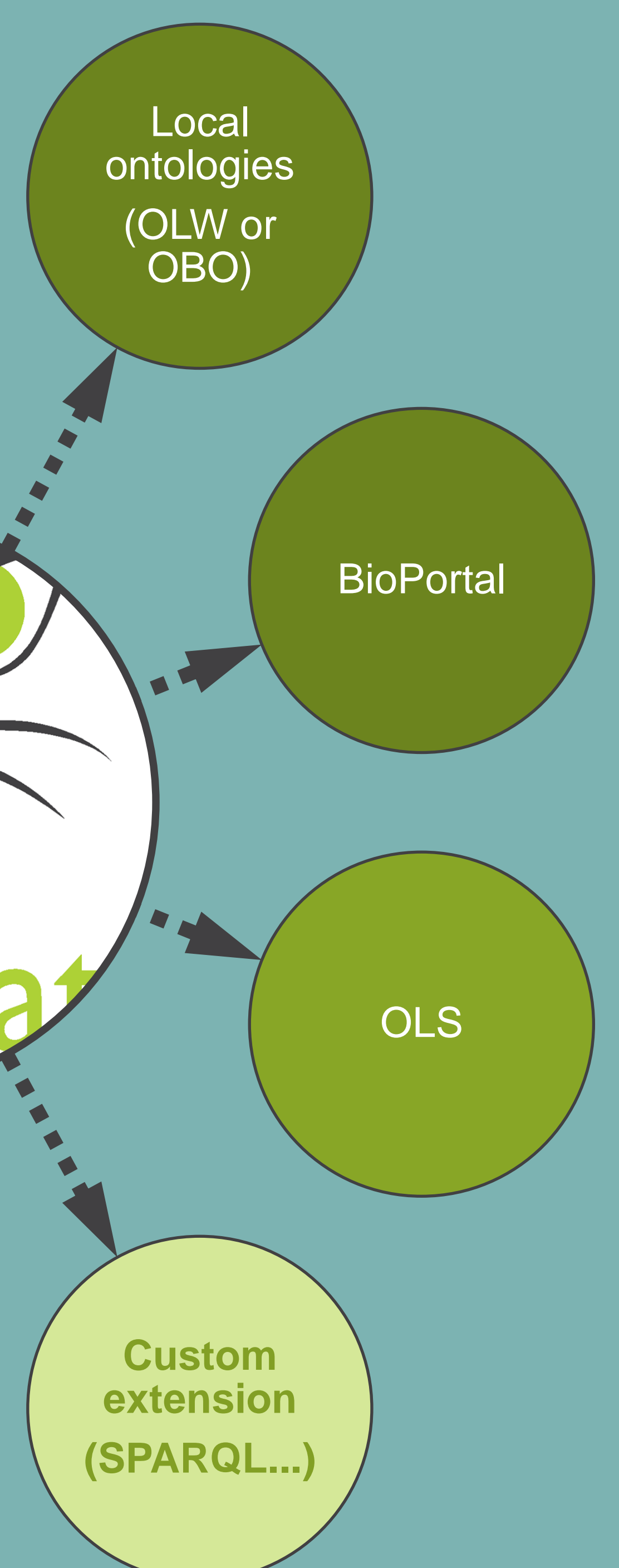
Three modes of operation:

- find optimal mappings
- provide mappings suggestions
- detect erroneous mappings

A wider problem – such mappings are found in everything we do

Ontology-driven applications

Asynchronous requests to individual service implementations



Content overlap between NCBO BioPortal and EBI Ontology Lookup Service illustrating the need to connect to both repositories [created in VennMaster]

Projects

- Zooma (zooma.sf.net)
- Experimental Factor Ontology (www.ebi.ac.uk/efo)
- eXtensible Phenotype and Genotype platform (www.xgap.org)
- MOLGENIS biosoftware platform (www.molgenis.org)

Acknowledgements

The authors would like to thank Eamonn Maguire for designing the OntoCAT logo. This work was supported by the GEN2PHEN, SLING, NWO/Rubicon, BioAssist/Biobanking, and BioRange grants. Special thanks go to NCBO BioPortal and EBI OLS support teams.

For further information

Please contact tomasz@ebi.ac.uk. Software available at ontocat.sf.net. A link to an online, PDF-version of this poster is available from www.ebi.ac.uk/~tomasz/pub/ismb2010.pdf