Interlinking and Visualizing Linked Open Data with Geospatial Reference Data

Abdelfettah Feliachi[1], Nathalie Abadie[1], Fayçal Hamdi[2], and Ghislain Auguste Atemezing[3]

[1] IGN, COGIT, 73 Avenue de Paris, 94165 Saint-Mandé, France
[2] CEDRIC, CNAM, F-75141 Paris Cedex 03, France
[3] EURECOM, Multimedia Department, Campus SophiaTech, France

1 Context and purposes

An increasing number of thematic data sets are published as RDF graphs and linked to other data sets by identifying equivalent resources in other data sets. Among the set of properties usually used as data linking criteria, geolocation (addresses, geonames, coordinates) remains one of the most commonly used.

However, resources that actually refer to complex topographic features are generally described by very simple geolocation properties, such as a position defined by coordinates (longitude, latitude). On the other hand, geographic reference data sets provide more precise geometric information about geographic features. Interlinking thematic linked open data sets with geographic reference data sets would enable us to take advantage of both information sources to link independent thematic data sets and create rich cartographic applications for data visualization.

This data linking task is generally performed by comparing properties values of each resource of a given data set, with homologous properties of the resources described in other data sets [3]. In the field of geographic databases, data matching is also performed by comparing properties, and especially structured geometries (points, lines, polygons) that are used to represent the shape and the location of geographic features. This task is usually based on distance measures chosen according to the type of the geometric primitives that must be compared [1, 2, 4, 5]. We aim at combining both approaches to link thematic data and geographical reference data and use the generated links in a data visualization application.

2 Approach and use case

In order to take advantage of existing data linking tools, we have converted geographic data and stored them into an RDF triple store. This task has been achieved by using the Datalift[4] platform that also enables to perform the linking process with other already published data sets, through the use of Silk [6] linking tool. Our linking approach is mainly based on geolocation properties comparison. That is why we have added to Silk, GIS distance measures, enabling it

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[4] http://datalift.org/

to compute the shortest distance between any geometric primitive and simple position locations used in thematic data sets.

The result of this interlinking process is a list of owl:sameAs links between entities of each datasets. These links are used to extend the geographic reference data set with information queried on the fly from the external thematic data sets through the visualization interface. We have applied this approach on a geographical reference data set about buildings and data about historical monuments extracted from DBpedia[5], on the area of Paris.

Fig. 1. DBpedia points locating historical monuments linked with polygons describing buildings in a geographic reference data set

3   Conclusion

The use of links between thematic and reference data could be further investigated to enable data visualization at different level of detail.

References

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[5] http://fr.dbpedia.org