

Semantics for signal and result collections through Linked Data:

How country is my country?

Kevin R. Page ¹, Benjamin Fields ², Tim Crawford ², David C. De Roure ^{1,3}, Gianni O'Neill ¹, Bart J. Nagel ¹

¹ School of Electronics and Computer Science, University of Southampton, UK

² Department of Computing, Goldsmiths University of London, UK

³ Oxford e-Research Centre, University of Oxford, UK

SCOPE AND MOTIVATION

The Linked Data movement encourages a Semantic Web built upon HTTP URIs that are published, linked, and retrieved using RDF and SPARQL.

Employing existing ontologies including GeoNames and the Music Ontology, we present a proof-of-concept system that demonstrates the utility of Linked Data for enhancing the application of MIR workflows, both when curating collections of signal for analysis, and publishing results that can be easily correlated to these, and other, collection sets.

By way of example we gather and publish metadata describing signal collections derived from the country of an artist; genre analysis over these collections and integration of collection and result metadata enables us to ask: “*how country is my country?*”.

While the demonstrator embodies a specific analysis (genre) and collection selection (by nation) to a simple use case, the approach and technologies are more generic and widely applicable – the common data model of RDF extends a myriad of possibilities for linking with data models and categorisations within and without the MIR community.

SYSTEM OVERVIEW

The prototype system consists of:

- 1) A SIGNAL REPOSITORY which serves audio files using the standard HTTP protocol and access mechanisms. For our demonstrator a subset copy of the Jamendo collection¹ is used. The signal repository also publishes, as Linked Data and using the Music Ontology², a small RDF sub-graph for each locally stored audio file that describes the relationship to the track it is a recording of and the “definitive” identifier (URI) for that track (as “minted” by the Jamendo Linked Data service at dbtune³).
- 2) A COLLECTION BUILDER web application that enables a user to publish sets of tracks described using RDF. Queries to assemble collections take advantage of Linked Data: the Jamendo service incorporates links

to geographic locations as defined by GeoNames⁴ and when use the Jamendo SPARQL endpoint we can enrich our query using the GeoNames ontology and data. For example, we can identify all the tracks offered by Jamendo recorded by artists from a specific country.

- 3) The ANALYSIS is performed by a NEMA genre classification workflow:
 - a) We have extended the myExperiment⁵ collaborative environment to support the Meandre workflows used by NEMA.
 - b) myExperiment has been modified to accept the collections RDF published in step 2) and pass the target tracks contained within to the analysis workflow.
 - c) A head-end workflow component has been written to dereference each track URI passed to the workflow and, using the Linked Data published by the signal repository, retrieve the local copy of the audio file as well as the reference to the original Jamendo identifier. This URI is persisted through the genre analysis workflow until it reaches a new tail-end component where the analysis is published using RDF – including links back to the Jamendo URI.
- 4) A RESULTS VIEWER web application retrieves the collections RDF from 2) and results RDF from 3), cross-referencing them via the common identifiers used throughout the system. The user can identify trends in genre classification within and between collections. Results can be pooled through existing and new collections and inform the creation of new sets.

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¹<http://www.jamendo.com/>

²<http://musicontology.com/>

³<http://dbtune.org/jamendo/>

⁴<http://www.geonames.org/ontology/>

⁵<http://myexperiment.org/>