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PARIP Explorer - Researching the Researchers

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Abstract. PARIP Explorer is a rich graphical client interface to a Web Service that allows querying and updating of a FOAF database of drama research. The software addresses problems arising from an evolving research field, a geographically distributed community and multiple views of the research terrain.

Keywords. FOAF, SeRQL, social networks, visualization, Web Services

1 Introduction

PARIP Explorer is a rich graphical client interface to a Web Service that allows querying and updating of a FOAF (Friend of a Friend) [1] database of drama research. This real-world application of the Semantic Web serves as both an extensible record of performance research as well as providing a creative environment for interactively discovering and describing relationships between that research. The work draws on existing social network visualization software, such as FOAFNAUT [2], JUNG [3] and TheyRule [4], extending the basic directed graph metaphor to allow the creation of customised layers of taxonomy on top of, or instead of, those held in the shared database. This extension reflects a specific requirement of the PARIP [5] research community to be able to describe their research using customised ontologies and to reinterpret or map between existing ontologies.

The software is being developed as part of the PARIP project. PARIP, Practice as Research in Performance, is a five-year project hosted by the Department of Drama: Theatre, Film, Television at the University of Bristol. PARIP's objectives are to investigate creative-academic issues raised by practice as research, where performance is defined as performance media: theatre, dance, film, video and television. As a result of PARIP's investigations and in collaboration with colleagues, educational institutions and professional bodies throughout the UK and Europe PARIP aims to develop national frameworks for the encouragement of the highest standards in representing

practical-creative research within academic contexts. PARIP undertakes critical investigations that feed into the generation of creative digital tools for the wider research network - website / database / e-journal / symposia / multi-media and multi-stream materials.

2 Problems Addressed in PARIP Explorer

PARIP Explorer addresses a number of problems that arise from the evolving nature of the PARIP community, the geographically distributed PARIP membership and a plethora of individualistic views of the research terrain. Similar challenges are faced by research communities in other disciplines and so the following analysis has broader relevance outside of the PARIP project itself.

2.1 Decentralised Membership Database

The PARIP project has a fixed lifetime and consequently, the maintenance of a database beyond the end of project funding presents serious practical problems in terms of keeping data current and adapting the database as requirements of the community change over time. Existing databases of performance research are centralised and tend to rapidly go out of date and become irrelevant over time. By adopting FOAF as the format for the database, it becomes possible for ownership of performance research data to remain with the practitioners. Instead of PARIP developing "the" centralised database it has created open source Web tools to allow anyone to create their own PARIP FOAF database - even after the PARIP project ends. Consequently, the current centralised PARIP membership database is merely a starting point and it is anticipated that, in the future, FOAF aggregators can be used with these tools to populate specialist interest PARIP databases or to allow independent replication of the research community's data.

2.2 Resistance to Centralised Ontology

The innovative nature of performance as research mitigates against the creation of a globally applicable ontology, or even a small number of ontologies, that would be useful in describing semantics of the PARIP database. In fact, part of the research process involves the creation of ontologies that are highly specific to a research subdomain or to a new view of the entire domain. Therefore PARIP Explorer has to support the superimposition of multiple customised ontologies onto the data. Through the sharing of customised ontologies and support for mapping between them, PARIP Explorer facilitates re-use without forcing rigid adherence to inappropriate ontologies.

2.3 Open-ended Query Requirements

Some important advantages of adopting FOAF for the membership database include the inbuilt ability of RDF to cope with incomplete data and to allow merging of data from different sources. These factors are particularly important for PARIP as the future requirements of the data are unknown and need to adapt as performance research evolves.

The initial PARIP membership data that was converted to FOAF could equally well have been held in a relational database due to the regularity of the data. However, this data has been supplemented by manually RDF annotated transcripts of interviews with members and with automatically generated metadata produced by information extraction applied to natural language text. Consequently, the quantity, type and coverage of data about the research varies widely across the database. FOAF and RDF are well suited to this irregular, highly structured data.

3 Software Architecture

The PARIP membership database is implemented in SWI Prolog [6], which has build-in support for large in-memory RDF triple stores as well as Prolog modules for OWL and the SeRQL [7] query language. The database is exposed through a Web Service running as a multithreaded SWI Prolog server. This configuration is both easy to install and maintain, has modest hardware requirements and, by virtue of SWI Prolog's multi-platform support, runs under Windows, Linux, Solaris or OS-X. As a Web Service accepting SeRQL queries and returning RDF, the membership database exists as a free-standing resource usable in its own right independently of the current PARIP Explorer client.

Where possible, PARIP Explorer uses standards-based and open source software. This has not been entirely possible in the current implementation of the client. The first choice for a graphical client interface to the Web Service was SVG [8] but the current version of SVG (1.1), while well suited to the graphical visualisations, does not support word wrapped text, thus making the prospect of developing, sometimes lengthy, editable fields of text particularly difficult. Therefore, the client is currently implemented in Macromedia Flash [9], helped enormously by the donation of code by the TheyRule social network site.

4 Accessibility

Although the current version of Macromedia Flash (MX 2004) has sufficient accessibility features for the creation of US Section 508 compliant user interfaces, it has some considerable way to go before it can match SVG's capabilities in this area. This is one of the key reasons that the project would have preferred to have implemented the PARIP Explorer client in SVG rather than in Flash. Ultimately, once SVG 1.2 is sup-

ported in mainstream plug-ins such as Adobe's, it is anticipated that any future versions of the client will be refactored to use SVG. In the meantime, a non-graphical XHTML client is being developed as a more accessible alternative to the graphically intensive Flash client.

5 Availability and Potential for Re-use

Both the client-side and server-side software of PARIP Explorer has the potential to be re-used, either together or individually, in generic FOAF-based applications. Upon completion, the software will be freely available from, most likely, an open source repository like SourceForge.

The PARIP RDF database, subject to suitable hosting arrangements, will continue as a publicly accessible Web Service resource for querying and extracting FOAF. Unrestricted availability of the PARIP membership data on the Web was a prior condition of its inclusion in the database and there are no specific restrictions on its use.

References

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