

# Who Reviews this Article? Collaboration Spheres in support of Scholarly Publication

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**Abstract.** Science is incremental and cyclic. New breakthroughs are built on top of previous results, which will themselves be the basis for future developments once validated by peer scientists and accepted for publication in scholarly communications. However, the process of identifying suitable reviewers for a particular article can be cumbersome and costly. Not only do journal editors need to have a thorough, personal knowledge of their journals and the members of the community who can be suitable reviewers, but also they must have an eye for spotting potential conflicts of interest that may raise biased reviews. Thus, means are required that assist editors in order to identify suitable reviewers amongst members of scientific communities. In this paper we present an expert finding system based on the application of the Collaboration Spheres search-by-example visual interface, to the case of the American Psychological Association (APA), a publishing body with over 70 journals, 54 interest groups, and 134000 members, including researchers, educators, clinicians, consultants and students. We show how we enriched APA's previously existing RDF data model and produced an extended dataset, which explicitly materializes the relationships between authors, articles, and their organizations. Based on this dataset we describe a service layer implemented as a set of SPARQL queries which feeds the Collaboration Spheres interface and enables the required expert finding capabilities.

## 1 Introduction

Research is intended for the betterment of society and the world, and science is incremental. Important discoveries and developments are built on top of previous research efforts, which are validated by peer scientists and accepted for publication in scholarly communications. However, the process of identifying experts in a particular field, which can be suitable reviewers for a particular article can be cumbersome and costly.

In this paper, we describe the system that aims to help journal editors, conference and workshop chairs on identifying suitable reviewers for a particular

paper, by providing a nice visualization of related authors and papers. To this end, the system relies on an innovative social network visualization, namely Collaboration Sphere, CSs.

In a nutshell, the visual metaphor called Collaboration Spheres allow search through exploration of scientific social networks based on a combination of people and information objects. This search paradigm is built around the use of customizable contexts that act as intuitive examples conducted by the users. This tool eases collaboration, expert finding and access to relevant information.

It is worth mentioning that in this case we plug the Collaboration Spheres over the APA enriched dataset, but the CSs are customizable and they can plug to other datasets, coming from different domains, with minor configuration changes.

## 2 Expert finder

The Collaboration Spheres<sup>3</sup> are implemented as a web application that covers the process of finding a good reviewer for a specific article or publication. The Collaboration Spheres are a visual metaphor of concentric circles where the most important part (the article) is placed in the center. The level of importance decreases as we move away from the center. The metaphor is helped by the use of intuitive colors and iconography. In that way, the user experiences a level of trust based on closeness. The process is driven by actions performed by the user while creating different contexts near the article towards his/her final objective which is to find good reviewers. A context is a group of articles and authors surrounding the main article that are taken as the parameters of the search. Each action allows the modification of context in an intuitive way and offers summaries of information that may help on understanding the available resources.

### 2.1 Interface Description

The user interface has been designed in order to keep a minimalist layout that makes user experience smooth and simple. The screen is easily divided in four different parts:

**Spheres** The main part displays a set of concentric circles. These circles have two different functionalities. On the one hand, the center of the circles contains the main article for which we are looking for reviewers. Its adjacent circle is the place where search queries are defined through dropping elements from the lists of items(see Lists) for creating contexts. On the other hand the two external circles offer the results of the reviewer finder. The results are small icons that use different colors depending on the relative quality of the recommendation (green for the best results, yellow for medium, and red for weak recommendations). The icon may have a warning sign associated if a conflict of interest (such as previous co-authors or same organization) is detected for the recommended reviewer.

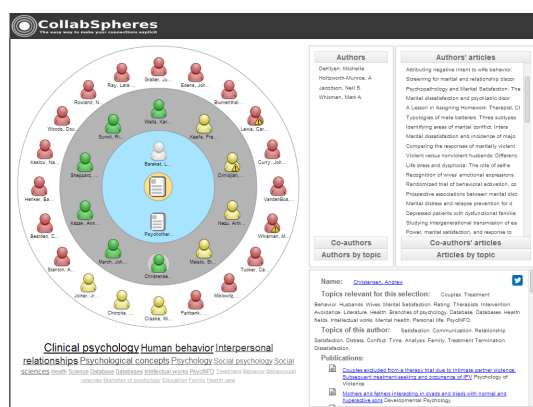
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<sup>3</sup> <http://csinfo.isoco.net/stats.htm>

**Lists** A total of six lists are loaded on the right side of the screen. They are divided in two columns: authors and articles. Each column has three lists. The lists on the first column are: list of authors of the main article, list of previous co-authors of the main authors and a list of authors which have worked on related topics to the article to be reviewed. The lists on the second column are: articles of the main authors, articles of previous co-authors and topic related articles. By preselecting the listed item we ease the task for the user by removing non relevant information and keeping only elements oriented for the recommendation task. All the items of the lists are draggable and can be dropped on the Spheres in order to customize the context.

**Tag Cloud** A tag cloud that gathers the most representative topics of the contexts that are created by the user is placed beneath the Spheres. The tag cloud allows the understanding of the search and results at a glance.

**Information box** Each element of the lists and the spheres is clickable. If they are clicked, a box of information placed on the right-bottom corner of the screen loads a brief summary of information, together with a link to its uri and a list of relevant topics for the current context. The purpose of this box is to offer quick summaries of every element that the user wants to inspect without the need of leaving the Collaboration Spheres page.



**Fig. 1.** User interface screenshot

## 2.2 Basic Architecture

The architecture of the system consists of three modules. Each module provides the needed information to the others creating a complete system.

**Data Module** The Collaboration Spheres use data provided by the APA VIVO<sup>4</sup> platform[2], which is an RDF dataset holding authors, publications and additional data from the psychology domain. The base dataset is imported to our

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<sup>4</sup> <https://vivo.apa.org/>

repository, transformed and with topics from the titles and abstracts that have been extracted using the TextRazor<sup>5</sup> API and Knowledge Tagger[1] working together with a Thesaurus<sup>6</sup>. The transformation and enrichment using topics for the authors and articles are made in order to get an explicit representation that improves the querying process in terms of complexity and time. The post-processing calculations are used to add a weight value for each topic in every article and to assess an expertise value to the authors. These assigned weights are the key part of the recommendation. The final dataset is stored in a Virtuoso Triplestore accessible via HTTP SPARQL queries.

**Web Services** The communications between the Data Module and the Front End are performed by the Web Services. It is a web project that triggers different SPARQL queries by using JENA under user request. The results are processed and returned via REST-JSON to the Front End.

**Front End** A web application with a browsable interface that is directly available for the users. The interface reacts to user actions and throws different Ajax queries to the REST Services. It has been developed in HTML5, using also javascript, jQuery and CSS.

### 2.3 Scenario

In this scenario the editor in chief of the Journal of Personality and Social Psychology<sup>7</sup> is trying to select reviewers for a submission they have just received. The first step will be to open the collaboration spheres for that Article:

- The selected Article is called "Attachment change processes in the early years of marriage"<sup>8</sup>.
- Then we can launch the Collaboration Spheres for the Article<sup>9</sup>.

As we can see, at the tag cloud shows the most relevant topics for the Article placed in the center of the Collaboration Spheres and we get a preliminary set of recommended reviewers for it.

Since we want to define a bit better the topics for our context, i.e. the special issue, and, in order to get better recommendations, we will add an article of our interest (can be found at the Articles by Topic section), which is very related to the topics of the special issue. We select the following article in the Articles by topic panel on the right and drag and drop it into the blue circle of the context of interest:

- The added article is "Adult attachment and the transition to parenthood"<sup>10</sup>.

<sup>5</sup> <http://www.textrazor.com/> TextRazor provides topic extraction and additional Wikipedia URIs for different categories.

<sup>6</sup> A thesaurus of Psychological Index Terms, which is updated regularly to encompass new and changing topics.

<sup>7</sup> <http://www.apa.org/pubs/journals/psp/>

<sup>8</sup> <http://vivo.apa.org/individual/n61963>

<sup>9</sup> <http://apaproject.isoco.com/index.html?id=http://vivo.apa.org/individual/n61963>

<sup>10</sup> <http://vivo.apa.org/individual/n5724>

Now the editor in chief will include some of the members of the Editorial Board (Interpersonal Relations and Group Processes Section<sup>11</sup>), who will serve as exemplars of the knowledge required to properly evaluate the submissions which are received. Suitable reviewers will therefore be knowledgeable of (part of) those topics. This way we increase the alignment between the related topics in the expertise of our editors and the recommended experts for reviewing the article. In this case, the editor in chief adds:

- Consulting Editors: Bolger, Niall<sup>12</sup> and Algoe, Sara B.<sup>13</sup>
- Associate Editors: Finkel, Eli J.<sup>14</sup> and Gable, Shelly L.<sup>15</sup>

We can see at every addition how the main topics change in the tag cloud and how the recommendations are adjusted to the context. When the editor in chief adds the last of the associate editors, the relevance of the different related topics seems to be uniformly distributed. The editor in chief then may want to reconsider the composition of the board and replace some of the editors (e.g. Gable with another expert with knowledge about other topics more, which the editor in chief finds especially relevant for the special issue). In this case, the editor in chief selects an author who brings in expertise related to topics like alcohol abuse:

- Zywiak, William H.<sup>16</sup>

In addition to the summary that we provide for each author and article, the system can also launch a Twitter search that covers his/her/its intersection with the most relevant topics of the context of interest.

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## References

1. Panos Alexopoulos, Boris Villazon-Terrazas, and Jose Manuel Gomez-Perez. Knowledge tagger: Customizable semantic entity resolution using ontological evidence. In Steffen Lohmann, editor, *I-SEMANTICS*, volume 1026 of *CEUR Workshop Proceedings*, pages 16–19. CEUR-WS.org, 2013.
2. Hal Warren and Eva Winer. APA VIVO: A Semantic Framework for Scholarly Identity and Trusted Attribute Exchange. In *9th Extended Semantic Web Conference (ESWC2012)*, May 2012.

<sup>11</sup> <http://www.apa.org/pubs/journals/psp/edboard-irgp.aspx>

<sup>12</sup> <http://vivo.apa.org/individual/n41433>

<sup>13</sup> <http://vivo.apa.org/individual/n59044>

<sup>14</sup> <http://vivo.apa.org/individual/n36079>

<sup>15</sup> <http://vivo.apa.org/individual/n37385>

<sup>16</sup> <http://vivo.apa.org/individual/n8844>