ScienceDirect® goes social: a social network for scientists integrated with online digital library

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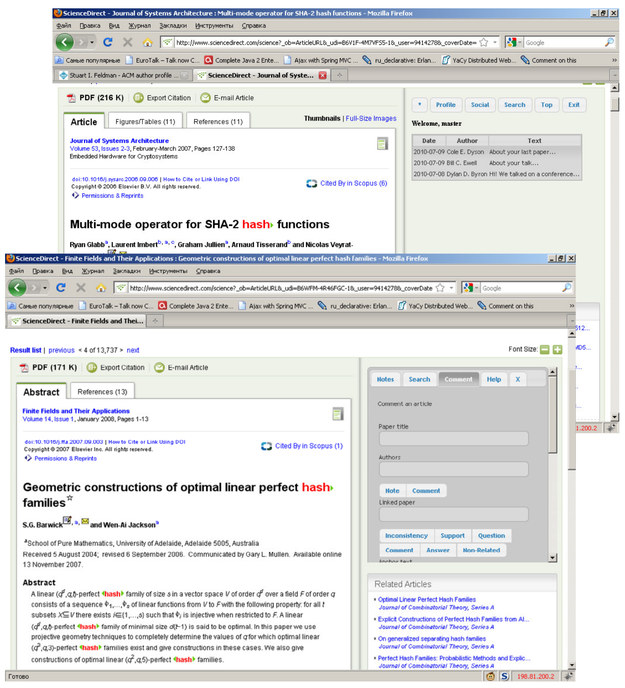
Overview

Online digital libraries exist for a long time, offering works in a large number of domains. A lot of work has been done to enrich the functionality of such systems: citations, research genealogy, keyword search and a lot more.

Our idea is to fuse social network and such digital library and introduce not only usual social network features, but a possibility to discuss papers.

Also, a scientist's notebook for keeping ideas and reviews privately was done.

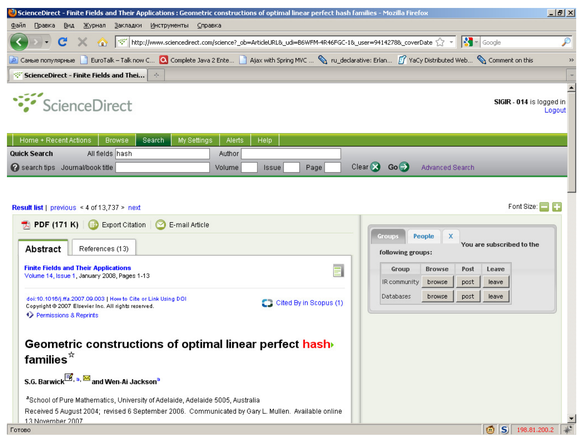
The proposed system offers a type system over comments which can lead to an interesting queries:



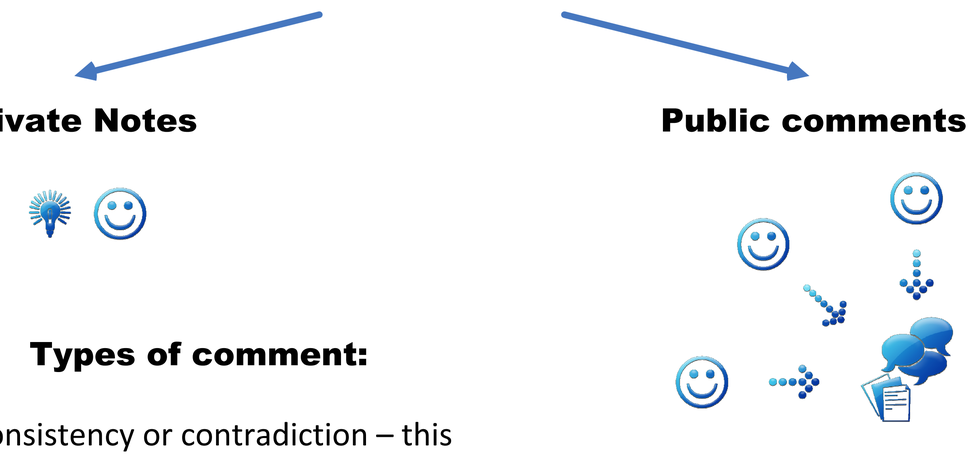
- What did a scientist X think about problem Y?
- What are the most active research topics in the domain of X?
- What are the most disputed papers?
- A lot more of simple (but still useful) queries which can be answered by our system.

Social Part

The well known social network features which become a standard de-facto:
1) Personal profiles
2) Groups or communities
3) Personal messaging
4) Privacy mechanisms – the problem is to integrate access of many people from the same institutional login (additional authorization)



Paper Information Management Part



Types of comment:

- Inconsistency or contradiction – this type of comment is applicable when the fact stated or used in the paper contradicts to your opinion, or to opinion of others. In this case a Linked Paper field might come in handy.
- A question – is different from the latter. This is a merely a clarification request. Very useful when bound to Text Anchor.
- Answer – an answer to both of these two previous question types.
- Support – a type of comment to indicate that you agree to the information provided. It can be backed up with a Linked Paper.
- Non-related comment is given to all other possible types.

Comment or Note

1) Comment Author
2) Commented Paper
3) Text
4) Date
5) Comment Type
6) Linked Paper
7) Text Anchor

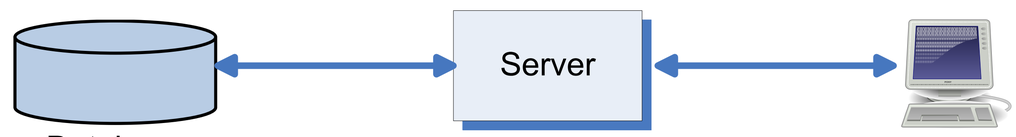
Related Work

ACM Digital Library author profiles (beta): a comparison

Strong points:
- More oriented on static profiles
- Entity disambiguation works
- Affiliation history (ordered)
- Complex bibliometrics features
- More content: photos, awards
- Still beta, probably more to come

Benefits of our approach:
- Live discussions in context of paper content
- Complex queries to comments, opinion mining
- Scientist's notepad
- Communities and personal mail
- Promotion of inter-domain collaboration

Architecture and Implementation Details



Database: MySQL

Server: 1) Java Servlets: Spring (MVC+Security) and JSP 2) Tomcat Web Container

Client: 1) JavaScript: jQuery and jQueryUI 2) AJAX

Major Problems

Technical

Cross-Site Scripting

1) This restriction leads to problems with implementing markup of paper text with comments
2) The same restriction hampers information flow in another direction: our application doesn't know the paper being browsed, if it is not told explicitly

Architectural Issues

1) Performance issues: currently a toy examples
2) Privacy issues

Entity Disambiguation

How can we distinguish differently spelled names, for example to notify author of comments?

This is a well-known problem and a lot of approaches exist

Scientific

Anchor Domain Operations

Operations on text anchors: resize, merge and security problems

Combining Results of Search Engines

In some cases (for example when no comments found), we can return a paper which is considered relevant, but was not discussed before. In order to do that, we should be able to traverse ScienceDirect® with it's API

Future Work

Short-Term

1) Automatic fill-in of comment forms
2) Proper additional markup of papers
3) Simple profile Content-Based recommender
4) Mixing-up results of provided API search and constructed search engine

Long-Term

1) Entity disambiguation
2) Complex Collaborative Filtering Recommender
3) Privacy issues: privacy preserving groups, etc

A Really Long Way

1) Flash-based Collaborative paper edition tools
2) Automatic formatter to different journal formats
3) From groups to conference registration and review systems

And a lot more!

Try decoupled demo at: http://adm2.math.spbu.ru:84/springapp/Login.html