



Hasso
Plattner
Institut

Improving Search in Tele-Lecturing: Using Folksonomies as Trigger to Query Semantic Datasets to Extract Additional Metadata

International Conference on Web Intelligence,
Mining and Semantics (WIMS 2011)

Franka Moritz, [Maria Siebert](#) and Christoph Meinel
Hasso-Plattner-Institute
University of Potsdam

Agenda

- Description of the tele-TASK Project
- Motivation
- Possibilities for embedding semantic information
- Examples of the usage of the data
 - Search function
 - Recommendation function
- Conclusion

Research project: tele-TASK

- System for recording lectures
- Records two video and one audio stream
- Used since 2001
- More than 3200 lectures recorded
- More than 8000 video podcasts provided



tele-TASK Web Portal

http://www.tele-task.de



tele-TASK more than video!

SEARCH [input] LOGOUT

Logged in as: Handbuch Beispiel

ARCHIVE LIVE WEBCAST tele-TASK MY tele-TASK PRESS CONTACT

Manage my Profile
Change Password
Change E-Mail
TT Staff
TT Staff Lecturer
Manage my playlists
Manage my ratings
Manage My Notes
Manage my tags
Manage my links

powered by HPI Hasso Plattner Institut IT Systems Engineering | Universität Potsdam

News

11.03.2011 Statistics
First statistic data is visible on the tele-TASK webpage. You can find a small overview of the available lectures on ... [more]

13.02.2011 Linking external informations
It is possible to provide additional links to a lecture using the new linking functionality of the tele-TASK portal. Every ... [more]

01.10.2010 New Search function
A new search function is available. Starting today you are able to search all objects, getting the results together in ... [more]

10.07.2010 New main page
In the last days we reworked our main page, to present more information. On the main page you can find ... [more]

all news ...

Copyright © 2009-2011 – HPI Potsdam

tele-TASK more than video!

SEARCH [input] LOGIN

ARCHIVE LIVE WEBCAST tele-TASK MY tele-TASK PRESS CONTACT

powered by HPI Hasso Plattner Institut IT Systems Engineering | Universität Potsdam

FEATURED VIDEOS

SERIES Prof. Dr. h.c.mult. Plattner
Gründungsfeier des SAP Innovationszentrums in Potsdam
Die ersten von insgesamt 100 Informatik- und Mathematikexperten, die für das geplante „Silicon ...
11.02.2011 - 11.02.2011 | en de ★★★★★

SERIES C. Wulff
Bundespräsident Christian Wulff zu Gast am HPI
Am 9. November besucht Bundespräsident Christian Wulff das Hasso-Plattner-Institut. Im Rahmen ...
09.11.2010 - 09.11.2010 | de

SERIES Prof. Dr. Meinel
HPI Colloquium (WT 2009/10)
The colloquium gives the chances to learn the hot research spots from the world famous experts ...
01.10.2009 - 09.04.2010 | en de ★★★★★

Statistics

Number of series 240
Number of lecturers 1074
Number of lectures 3104

News

11.03.2011 Statistics

More featured videos ...

Internet Security - Weaknesses and Targets (WS 2010/11)

Wireless Security Security Methods (2/2)

Prof. Dr. Christoph Meinel

Hasso-Plattner-Institut Potsdam and Equivalence Privacy

26.01.2011

Wireless Security

Prof. Dr. Christoph Meinel

- Introduction 00:00:00
- IEEE 802.11 Wireless Lan 00:03:59
- WLAN Security Weaknesses 00:25:14
- WLAN Security with IEEE 802 00:37:58

00:23:11/01:26:33

powered by HPI Hasso Plattner Institut

Motivation

.Net 3-SAT AES **Ajax** algorithmen
 Amplifikation Android Angriffe Apache Approximation Approximationsschwelle
 Array ASCII Audio Authentifizierung backup Betriebssysteme
 Betriebswirtschaft Bing Binomial-Verteilung Block-Chiffre BPM BPP
 Browser Browserkompatibilität Bruce Schneier Brute-Force Angriff Bundespräsident
BWL C-Programmierung Cascading Stylesheets Chiffre China
 Chinesischer Restsatz Cloud Computing co-Klassen Compiler Composite Computer Virus
 Computer Worm coNP Cook'sche Theorem Corba **CSS** CSS 3
CSS Selektoren D-School darpa **data management** Data-Encryption-Standard **Datenba**
Datenschutz #kern fpc fpc-Algorithmen fpc-Modifikation fpc-Algorithmen

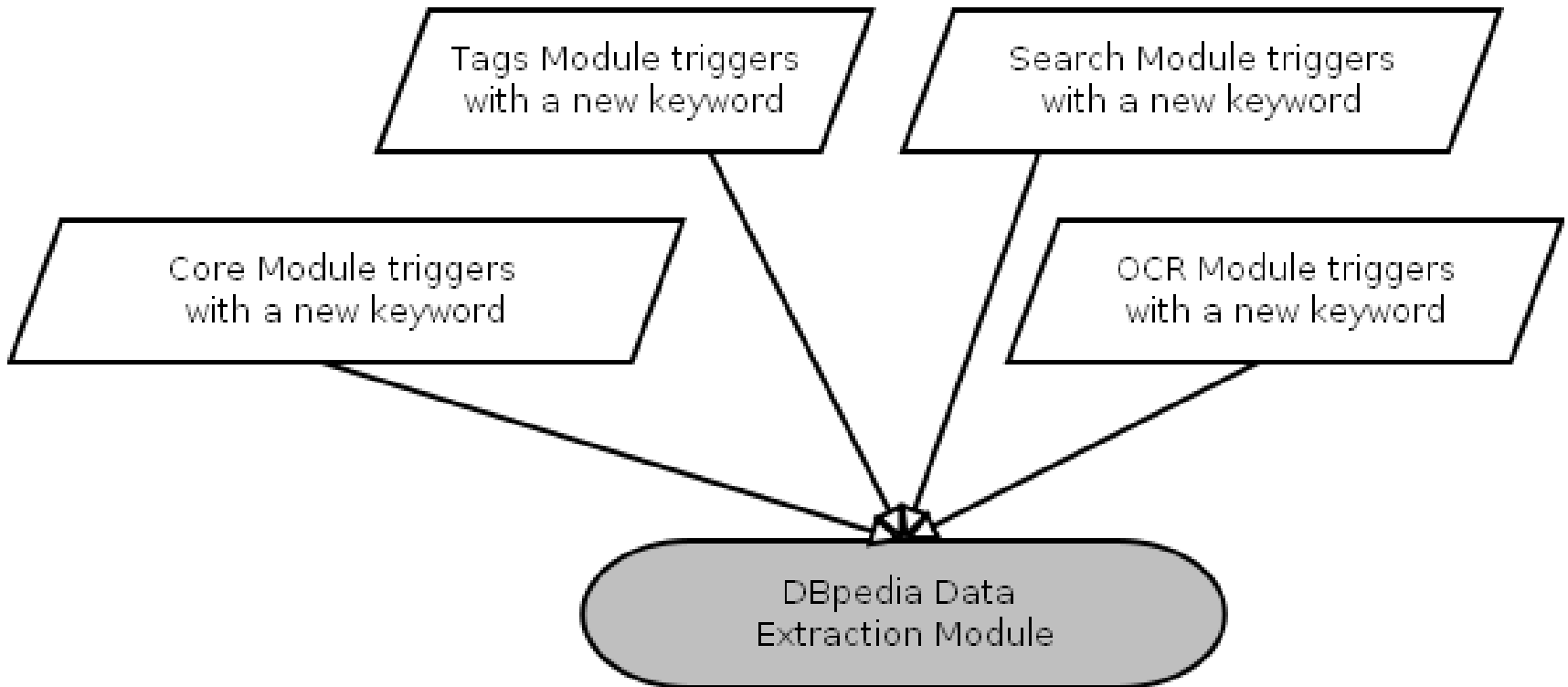
Desi

Ech
Erfüllb

gronau gronau autoteile groß grundlagen harald sack hash
 hasso hasso plattner henn Henness Hennessy Herczeg
 Hirschfeld Holger Giese hpi html implementation index
 informatik informatik impulse information Information Retrieval informatic
 Informationssicherheit informationssysteme Informationsvisualisierung inr
Internet internet Security ipsec ipv6 IT Sicherheit itil
 j2ee **java** javascript jquery Jubiläum jürgen müller
 kahn kembel kerberos komplexitätstheorie kontextfreie Kostenrech
Kratzer krcmar **kreitz** kryp krypto kryptografie
 kryptographie kryptologie lambda lattemann lecture linux
 logik löwis löwis programmiertechnik management Marketing maschinent
 material materialwirtschaft math mathe mathematik **Meinel**

Embedding DBpedia into the tele-TASK portal meta data

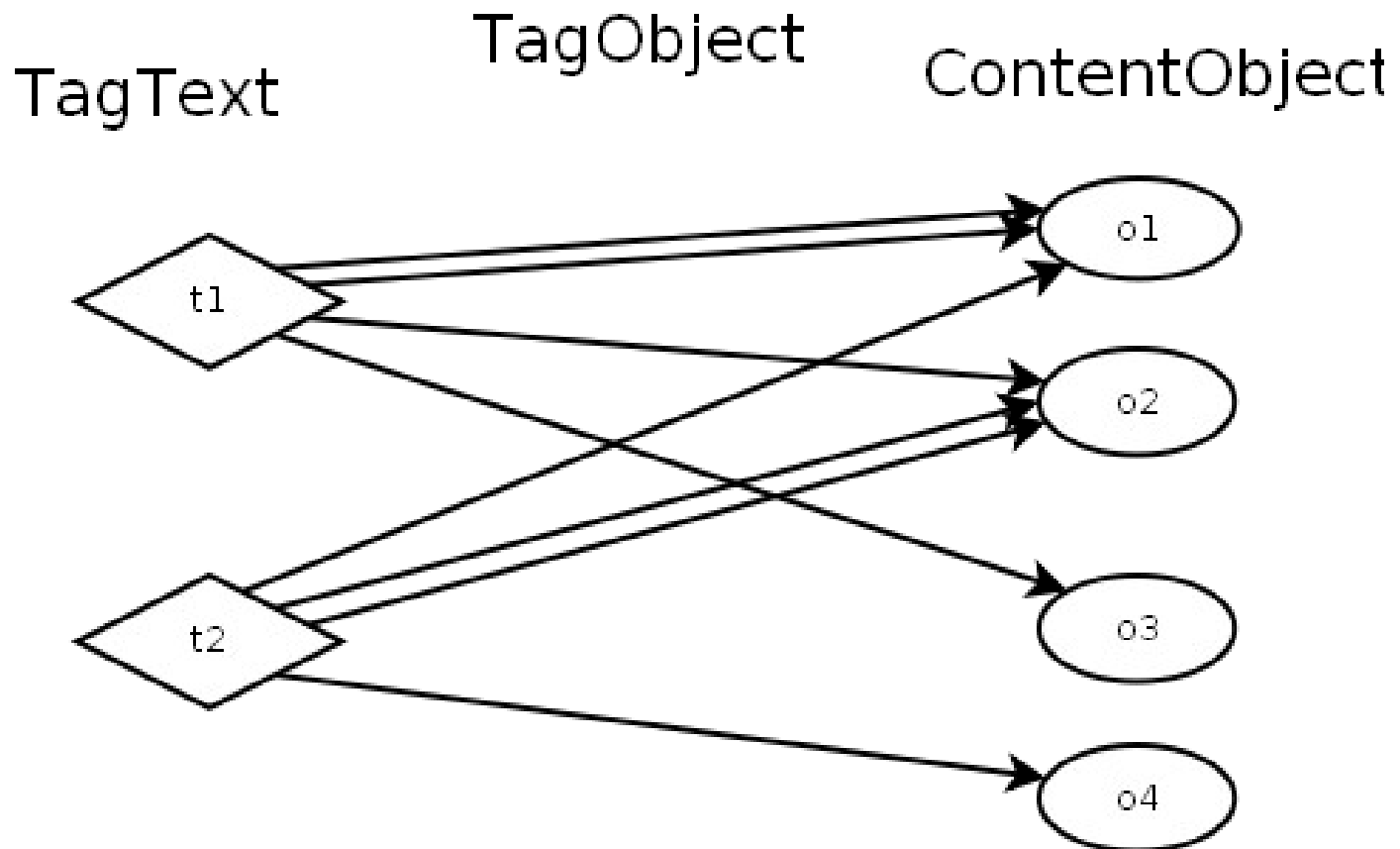
Different possibilities for data sources



Usage of the DBpedia data

- Extraction of keywords
- Search for representation in DBpedia
- Parsing information from DBpedia
- Adding information to the database
 - Synonyms or generalizations of terms
 - Descriptions of a term
- Using the parsed information in different projects

Definition of Tags



$$T(o) = \{\text{tags of object } o\} \subseteq T$$

Extending the Search function

- Adding additional data to searchable fields
 - Generalizations of tags
 - Synonyms of tags
- Search for tags with the search term in the description
- Extending the search request
 - e.g. using synonyms

Extending the Recommendation Function – Synonyms (1)

Synonyms:

- Synonyms create an equivalence relation
- Each group of synonyms generates an equivalence class

$$[t]_{\text{syn}} = \{t^* \in T \mid t^* \text{ is a synonym of } t\}$$

$$T/\text{syn} = \{[t]_{\text{syn}} \mid t \in T\}$$

$$T/\text{syn}(o) = \{[t]_{\text{syn}} \mid t \in T(o)\}$$

$$T_{\text{syn}}(o) = \bigcup_{S \in T/\text{syn}(o)} S$$

Extension of the Recommendation function - Synonyms (2)

- The normal similarity function for tags is extended to a more complex version
- Each equivalence class of tags is treated like one tag in the simple calculation function

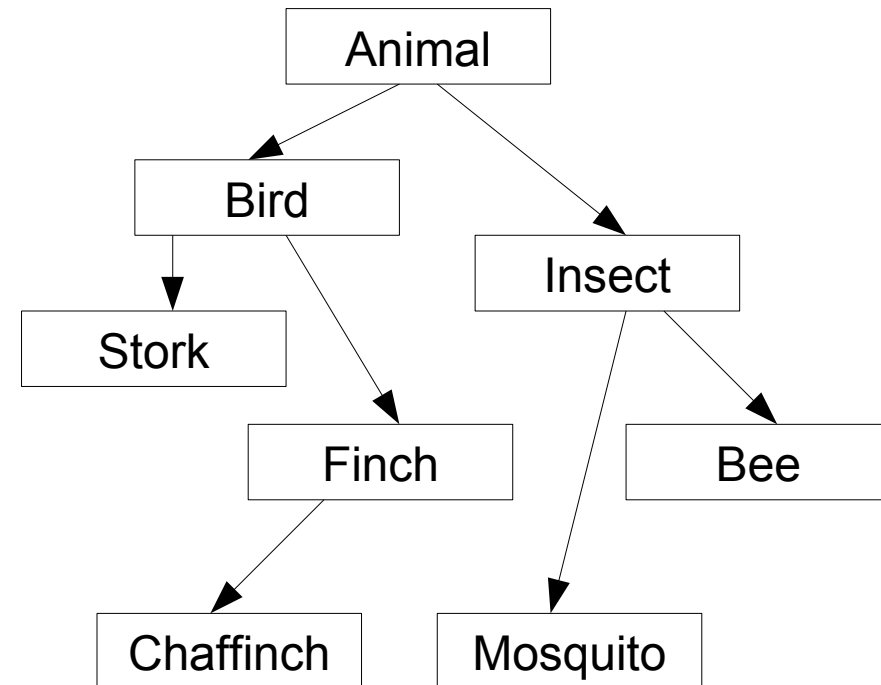
$$w_M(t) = \#\{c_i(o, t) \mid o \in M\} \in \mathbb{N}$$

$$\omega_{\{o_i, o_k\}}(t) = \frac{w_{T_{\text{syn}}(o_i) \cup T_{\text{syn}}(o_k)}(t)}{\#(T_{\text{syn}}(o_i) \cup T_{\text{syn}}(o_k))}$$

$$s_{\text{Tags}_s}(o_i, o_k) = 100 \cdot \frac{\sum_{t \in (T_{\text{syn}}(o_i) \cap T_{\text{syn}}(o_k))} \omega_{\{o_i, o_k\}}(t)}{\sum_{t \in (T_{\text{syn}}(o_i) \cup T_{\text{syn}}(o_k))} \omega_{\{o_i, o_k\}}(t)}$$

Extension of the Recommendation function - Generalization (1)

- Generalization creates partial order
- Distance between objects is unknown
- Defining sets of parents and children
- Calculating the distance of two objects in the tree as $dist(s,t)$



Extension of the Recommendation function - Generalization (3)

- Using distance as weight for calculation of similarity
- Using the weights of the tags

$$\Omega_{\{o_i, o_k\}}(t) = \frac{\sum_{x \in S(t)} \frac{w_{\{o_i, o_k\}}(x)}{\text{dist}(t, x)}}{0,5 \cdot \left(\min_{x \in T(o_i)} \text{dist}(t, x) + \min_{x \in T(o_k)} \text{dist}(t, x) \right)}$$

$$s_{\text{Tags}_g}(o_i, o_k) = 100 \cdot \frac{\sum_{t \in G(T(o_i)) \cap G(T(o_k))} \Omega_{\{o_i, o_k\}}(t)}{\sum_{t \in G(T(o_i)) \cup G(T(o_k))} \Omega_{\{o_i, o_k\}}(t)}$$

Conclusion and Future Work

- Implementation for tags was shown
- More triggers have to be included
- Problems to solve:
 - To few tags to generate for a good result evaluation
 - ◇ Advancement of user interest
 - ◇ Easier access to the functions
 - The results are not visible to the user



Thank you for your attention.

Maria Siebert
Hasso-Plattner-Institute
University of Potsdam
Potsdam, Germany