Hyperglossary Generating Program with Wiki Content and Modifiable JavaScript Automated Search Functionality.

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Abstract

One can postulate that the World-Wide-Web had its origins in the advent of HTML (hypertext markup language) which allowed navigation over the web through linked text. There was a fundamental limitation to this "web" as the links were confined by the knowledge of the author. As the content of the web grew, another way of navigation evolved through the advent of search engines. These allowed users to seek non-connected documents using key words instead of linked text.   A logical next step is to combine these two processes. We have developed some JavaScript code which does that, creating a Javascript Automated Search (JAS) document, where every word in the document is hyperlinked to a search engine by simply highlighting the word. We have embedded the ability for JAS into a wiki hyperglossary generating program that can read web pages or text documents. This program utilizes Asynchronous Javascript and XML (AJAX) links that allow users to interact with a hyperglossary database without ever opening a new web page. Thus a document viewed through this program has three types of hypertext links; intrinsic HTML links to other web pages, AJAX links to the hyperglossary and JAS links to search engines.

Introduction

During the Spring 2006 Confchem Conference on Web Based Applications in Chemical Education Rob Toreki presented a paper on the MSDS hyperglossary, which through the MSDS-Demystifier allowed users to embed hyperlinks to the MSDS hyperglossary in web pages and digital text documents. This hyperglossary is associated with chemical safety and each of these links sends you to a specific HTML page devoted to the term linked. We decided to create a wiki based hyperglossary generating program modeled after Dr. Toreki's hyperglossary where multiple authors could add to the content. This hyperglossary is fundamentally different than Dr. Toreki's in that it uses embedded div content to present information within the webpage dynamically, and does not link to the content through HTML, but uses AJAX to gather the data from the server (behind the scenes) and present the information on the web page using javascript.   This was done with no minor amount of input from Bob Hanson. He introduced us to AJAX and helped us come to realize that we could embed into our documents a new type of link, which for lack of a better word we will call a "JavaScript Automated Search " (JAS) Link. From the user's perspective, all you need to do is highlight a word and up pops a modified search, say a Google's definition search, on the word or words highlighted. Thus every term in

the text becomes a link, with some terms containing two links (highlight for JAS and click for HTML or AJAX).

The hyperglossary is a dynamic web site with two fundamentally different ways to access it; client (read only) which is open to the public, and administrative (read/write) requiring a login. We have created 3 types of password protected administrative access (master, full and restricted). As a description of this site can get rather long and drawn out we have created a series of screen-capture animations to provide you a tour of this program.

II. Public (Client) Access

The direct link to the hyperglossary is http://144.167.128.82:82/hyperglossary , which takes you to the server we are running it from. From this page you can choose any hyperglossary on that server with the drop-down box (default is chemistry) and clicking **View Account Hyperglossary**, or you can log in administratively. There are four forms for submitting material to the hyperglossary, the first two allow you to run content through the hyperglossary, the second two allow you to communicate with the administrators and suggest words. The document submission form strips all intrinsic HTML tags, formatting and pictures, but allows you to cut and paste digital text documents like MS Word and Word Perfect. The web page submission form allows you paste in a web page's URL. This form maintains images, links and HTML code, but will not accept a password protected page. At the bottom of the page are the remaining two forms where you can request terms be added to the hyperglossary, and give administrators a feel for your academic level.

When a page is submitted, javascript code is placed in the document which performs three tasks. The first defines the type of JAS link to be embedded into the document. **Popup blockers must be disabled for the JAS links to work** as you are opening a new web page. The second inserts the AJAX hyperglossary links into the document and these are not stopped by popup blockers as you never leave the web page. The third is an acknowledgment statement indicating the document is being run through the hyperglossary. At the time of this writing only two words are in the general chemistry hyperglossary, congenital and proton. To the best of our knowledge the AJAX hyperglossary links work with Safari, Firefox, Netscape and Internet Explorer browsers. The JAS links do not work on Safari but do work on Firefox, Netscape and Internet Explorer. If a document contains an HTML hyperlinked term that is also in the hyperglossary, the document's intrinsic HTML link takes precedence. We have thought about using a "hover" command for the AJAX link (allowing one word to have three links) but figured that would drive people crazy as leaving the mouse over an arbitrary word would activate the hyperglossary.

We have also created a table (below) that you can place in your own web page which allows you to submit material to a specific hyperglossary (the general chemistry in this case). This way you do not have to go to our site, pick a hyperglossary and then run it. Please note, at the time of the writing of this paper we only have two words in the hyperglossary (**proton** and **congenital**), as we are presenting a wiki hyperglossary generating program and not a wiki hyperglossary. So if you want to test the AJAX hyperglossary links you need to paste (or type) content with one of those two words into the document form or a URL for a web page that has those terms into the web page submission form. At the time of this writing the general chemistry hyperglossary precedes the Google JAS search with the term "definition:".

Document Hyperglossary	
	Web page Hyperglossary

Paste text in the above form to run the text through the hyperglossary. Highlight any word and it does a Google's definition search. Click a word with a dotted underline and it takes you to that hyperglossary definition. This only accepts text and does not preserve hyperlinks, but allows you to link word documents to the hyperglossary and Google search functions.

Paste a URL in the above form to run the page through the hyperglossary. Highlight any word(s) and it does a Google's definition search (including underlined words). Click a word with a dotted underline and it takes you to that hyperglossary definition. Click a solid underline and it takes you to that link (while leaving the hyperglossary). This function preserves pictures but can not read pages which require a log in.

Note, the above form is active and you can cut and paste documents or URL's into this web page. The material will be sent to the "chemistry" hyperglossary. If you wish to place this form into one of your web pages contact Bob Belford at rebelford@ualr.edu and we can send you the code. Of course you can just copy it from this page's source code, but then if we change the hyperglossary server location you will loose all functionality. We can also set it up so it submits data to a different hyperglossary

The following videos give you a tour of this program.

Client Side Screen-Capture Animations

Captivate Shockwave Audio-Visual Movie	Browser Viewable Version
I.1 Introduction to Wiki Hyperglossary	SW Movie VC0
I.1 Two ways to Access the Hyperglossary	SW Movie VC1
I.2 Submitting a Digital Document to the Hyperglossary	SW Movie VC2
I.3 Submitting a Web Page to the Hyperglossary	SW Movie VC3
I.4 Viewing the Same Web Page Under Two Different Hyperglossaries	SW Movie VC4
I.5 Other Types of JAS	SW Movie VC5

II. Master Administrative Access

Only one person has login access to the master administrative page and this is the person who runs the server where the PHP script and MySQL database is housed. This person can create multiple hyperglossary accounts. As this is password protected we have created a video to show you the simplicity of this site.

Master Administrative Screen-Capture Animation

Captivate Shockwave Audio-Visual Movie	Browser Viewable Version
II.1 Creating a Hyperglossary	SW Movie VM1

III. Full Administrative Access

Full administrative access not only allows you to add content but also define what the hyperglossary looks like and how it functions. Multiple users can have full administrative access to a hyperglossary. In addition to all the utilities a person with restricted access has, a person with full administrative access can perform the following tasks.

1. Add Users (with full or restricted access) and create user profiles (like password and email address). Note, when a client links onto a hyperglossary-linked term the content of that term is displayed along with some information on the person who initially created the term (like name, title, institution). The idea here is to give the client an idea of who wrote the content, but there is a technical shortcoming here in that it is not practical to show a history of all wiki edits to the client (although they are available to administrators).

2. Adjust JAS Settings
    a. Turn on/off JAS functionality
    b. Determine JAS link characteristics like color, underline, italics, bold
    c. Insert pre-text into a search (like Google's Definition:)
    d. Insert post-text into a search (narrowing the hits)

3. Add/Arrange Fields for Terms in the Hyperglossary. We are following the format developed by Dr.Toreki where he had 5 sections (data fields in our case) in his MSDS hyperglossary; Definition, Further Information, Books Available, MSDS Relevance and Further Reading.

Full Administrative Screen-Capture Animations

Captivate Shockwave Audio-Visual Movie	Browser Viewable Version
III.1 Add New User	SW Movie VFA1
III.2 Adjust Hyperglossary Settings	SW Movie VFA2
III.3 Create Content Fields	SW Movie VFA3
III.4 Editing Content Field Settings	SW Movie VFA4

IV. Restricted Administrative Access

Allows multiple users to use the web to add content to the hyperglossary in a wiki fashion. They can perform the following tasks

1. Add 1-20 new words at a time

2. Edit content fields of existing words.

3. Delete words

4. View Words with the following sort options
   a. Word (alphabetical)
   b. User name
   c. Author name
   d. Title
   e. Institution
   f. Count (how many times a word was found in a page
   g. Views (how many times a client looked up a word
   h. Order submitted

5. View History of each word's edits to see who modified what and when.

IV. Restricted Administrative Screen-Capture Animations

Captivate Shockwave Audio-Visual Movie	Browser Viewable Version
IV.1 Add New Words	SW Movie VRA1
IV.2 Editing Existing Words	SW Movie VRA2
IV.3 View Words	SW Movie VRA3

The Future

Through these videos we hope we have given you a feel for how you can create a hyperglossary. Anyone who is interested in using this application or contributing to its development is welcome to contact Bob Belford (rebelford@ualr.edu).

We have tried to set this up so you can use it in a variety of ways, and hopefully the discussions of this

paper will bring some of these to light. The most obvious application is the creation of a chemistry wiki hyperglossary by chemical educators with a target audience of the general public. If administrative access was limited to chemical educators than the quality of the content and the intrinsic peer review nature of a wiki would result in a valuble resource.

Since any public web page can be run through the hyperglossary it could be a new way of transmitting old work. For example, if you have already developed nomenclature tutorials, one of the fields in a nomenclature hyperglossary could be a link to your site. If multiple people contributed links to their work then the content of the hyperglossary becomes greater than its database. That is, if someone views a digital document and is unfamiliar with a word like hypochlorite, they now have the option of viewing that document through the nomenclature hyperglossary (and getting a link to your work). Thus in essence this is a user centered application where the user (client) has the ability to embed links to your work in documents which you did not author.

There are also creative ways an individual faculty member could use this in the classroom. For example, you could make a gradable class project out of it by giving each student restricted access and having them write content on a topic, like nomenclature. The "View Words" option provides a variety of sort functions (like view words by author name) that facilitate grading through the ways you can sort the database. You could have the students work in groups where each field is assigned to a different student and they could rotate fields as the words change. You can have students modify each other's content in a peer review fashion and track the work (holding them responsible for their "edits"). As they have access to the history, they know their edits are being recorded, and thus you have individual accountability for collaborative activities.

We will shortly be expanding on the JAS function and allow you to choose alternative search engines. At the moment we can do Google, Vivisimo, Google Scholar and One Look, but do not have the server-side script set up so you can choose. We are also looking into data acquisition and logic profiles which could be gathered by JAS usage patterns, and algorithms for employing these into digital documents.

In summary we have done two things. First, through JAS we have combined the two fundamental ways of surfing the web (linked text and search engines). Second, we have combined a hyperglossary with a wiki. It is clear that we do not yet have a wiki hyperglossary and in essence this paper is an attempt to develop one.

Return to the
[Fall 2006 issue of the Computers in Chemical Education Newsletter.](#))