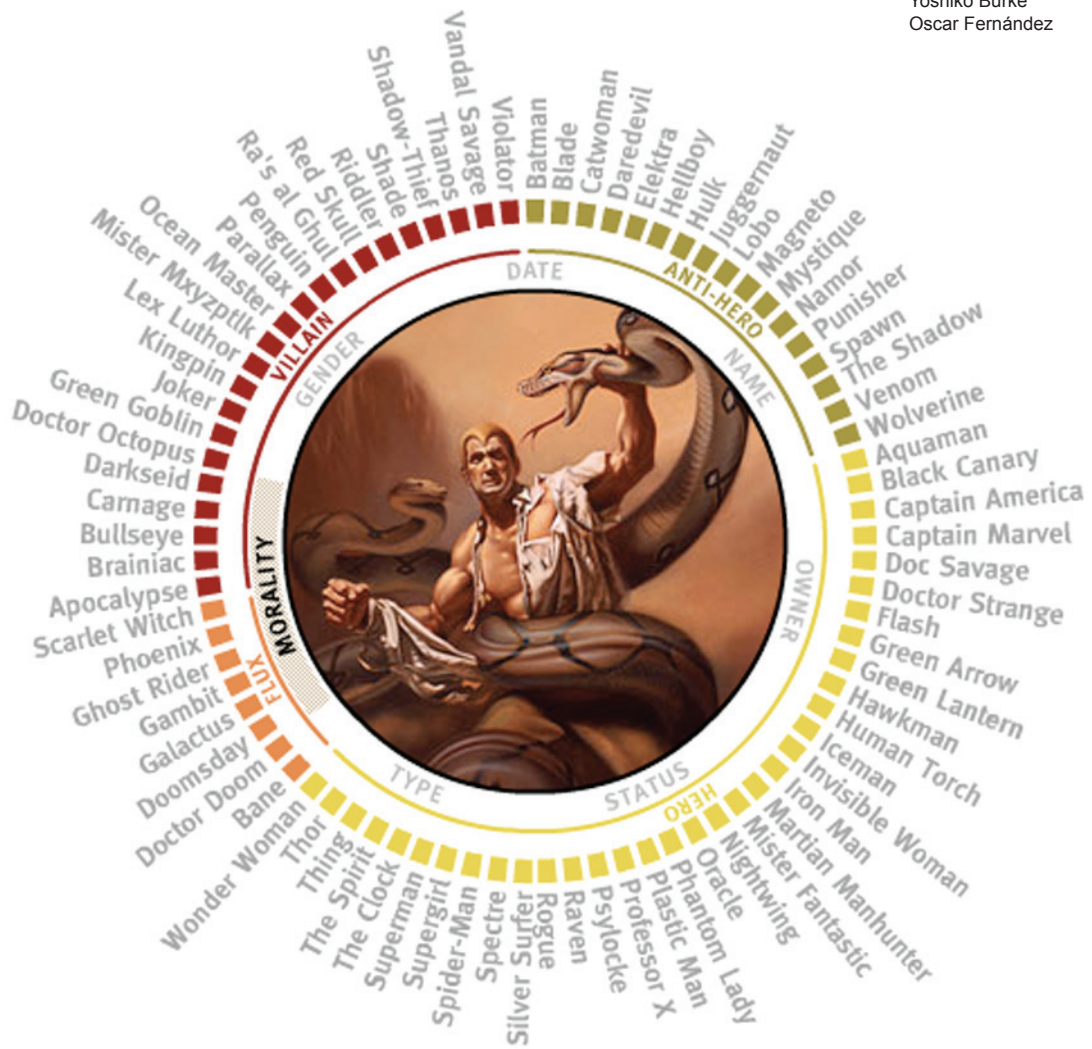Timothy P. King
Senior Capstone Project
*Mythos*
Spring Quarter
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**Fall Topic Research Report**

I intended to produce an interface that will identify, cross reference, and communicate various concepts within a diverse field. An area that could benefit from this sort of visualization is comparative religion, a field that has produced some of the greatest human arts and some of the darkest actions. As the collection of digital information continues to grow, it is important to have a reliable and simple way to search, examine, and compare the data that is available to us. This is a useful tool for any sort of data, especially when that data directly effects our lives.

The working title at this point is Syncretism, which is defined as reconciliation or fusion of differing systems of belief, as in philosophy or religion, especially when success is partial or the result is heterogeneous.

To begin, I researched the development of digital search engines like Yahoo and Google from their roots to modern day. I also investigated hypertext functionality as a means of non-message distracting reference. During this period I read many articles including: A Brief History of Search Engines (http://www.webreference.com/authoring/search_history/), History of Search Engines - Evolution & Revolution (http://webhome.idirect.com/~glenjenn/search/history1.htm), If Search Engines Could Read Your Mind (http://www.clickz.com/experts/search/opt/article.php/3513666), Wikipedia (http://en.wikipedia.org/wiki/Search_engine), Yahoo! (http://search.yahoo.com/search/options?fr=fp-top&p=), SPN Professional Profiles (http://profiles.socialpsychology.org/search.html), Princeton 3D Model Search Engine (http://shape.cs.princeton.edu/search.html), Mooter (http://www.mooter.com/moot), Kartoo (http://www.kartoo.com/), Liveplasma (http://www.liveplasma.com/).

The most familiar and basic type of display of data is a list. This is how matches are returned from search engines such as Google or Yahoo! In their standard form, there is simply a text field and all results are returned in order of the relevance assigned by the search engine. These offer more advanced modes where criteria can be refined. In either case, results are returned as a list and do not call out related or dissimilar content. Results were also separated into pages, so you can never find all matches in one place at one time. When a specific area is entered to explore in greater detail, all other results are removed. While some of the advanced features such as boolean searching are important, I found this approach to be very limiting for what I intended to do.



A typical structure of the results of a search using Liveplasma.

Liveplasma distinguishes each element from the others through the use of color. It also takes advantage of angle, distance, and size to show relevancy to the central topic. Unlike the other interfaces, focusing on a specific element rearranges the layout, but does not remove the other content, so you can still study its relationship in the greater structure.

Mooter is a web search engine that returns results as a series of nodes and clusters. It functions as a common search engine like Google or Yahoo!, but rather than listing results it displays them radiating from a central point. The drawbacks I found to this apparch are similar to that of the listing method. Not all results are displayed at once and exploring a topic in detail clears away all other results. The added dimensions of radius and angle allow for a denser amount of data in the same amount of space as compared to listed results, but these variables are not utilized in this case. Every node is colored similarly and positioned similarly, making it hard to quickly scan the results or see if things are related in any way.

Kartoo also strays from traditional listed results. Their method can best be described as a data cloud. Results are again positioned around the center of the screen. Unlike Mooter, radius and angle are used to show how related concepts are to one another and to the central topic. Size is also used here to show relevance to the central topic and the organizational method is labeled within the interface. They have the same disadvantage as Mooter in that all nodes are colored and shaped the same, making it hard to scan without reading. A useful feature of this setup is that rolling over any node will draw connections to related nodes and call attention to them.

As far as content, I began to read up on the basics of different faiths at sites such as: The Urantia Book Fellowship Site (http://www.ubfellowship.org/archive/readers/601_shinto.htm), MavicaNET (http://www.mavicanet.com/directory/eng/1730.html), Encyclopedia Mythica (http://www. pantheon.org/), Adherents.com (http://www.adherents.com/adh_branches.html), Om Sakthi (http://www.omsakthi.org/religions.html).

It is my hope that people who view this project will discover an interface that is intuitive and versatile. I hope they come away with a greater understanding of the common elements of major world religions and see common themes across cultures and the human need to create such beliefs. I would like to develop a better way of searching and comparing information, as well as referencing sources and informational roots.

While looking into possible interfaces and browsing the data available to work with, it became apparent that the field would need to be narrowed down if there was to be any hope of completing this project. The initial content for the interface was to be general comparative data, but over the early days it was narrowed to general mythology, then ancient mythology, then greek mythology, then religious mythology, and finally to the mythology of 9 major world religions with a focus on beings classified as a diety. At this point I felt that I could begin to gather information about these topics and experiment with methods of organization within an interface that accomplished my goals of simplification and visible relatedness of databases.

During the fall I learned the benefits and challenges present in using ASP.NET and MySQL to populate a Flash movie. A major reference at this time was http://www.w3schools.com/asp/asp_ ref_dictionary.asp along with a computer science friend, Jon Krech.

**Winter Research Report**

The definition of my project become blurry over the winter months. There was a realization that I became more focused on gathering data, learning what it meant, and explaining this in a highly textual manner. The design became disassociated with the function and seemed forced to hold data that would be better presented as a series of articles. In the process of researching religions it also became apparent that a great deal of data is either unknown or inconsistent. This proved extremely difficult to organize in any fashion that could be of value to people that did not already have an advanced knowledge concerning the subject, which was at odds with my desire to create a tool that could be used to introduce the information to new eager minds and also be useful to more knowledgable inquirers.

At this point, I re-examined the topic. I returned to defining what I wanted to do, and outlined it better. I found new resources that I had missed earlier and found interesting new techniques for data spaces. During the period of January and February, I further explored the possibilites of three-dimensional, linear, radial, plotted, and columnal database representations. I expanded potential topics back to all mythology (ancient, religious, national, and contemporary), as well as considering film, literature, and social networks. Having a large data set would create the richest interface from content perspective . Information that could be organized in several different ways, with data that could easily be collected, verified, and quantified into different categories. I felt that film and comics were the strongest for this critera. From a visual perspective, another problem that I was continually bumping against was a lack of unbiased, interesting imagery of abstract concepts such as Gnasha or Satan. Film and comics also had the richest visuals. I ultimately chose comics over film as there seemed to be more organizational categories for each character. While this would provide more of a challenge to me, it also meant there would be more depth and simplification would be more beneficial than in a topic with less variety.
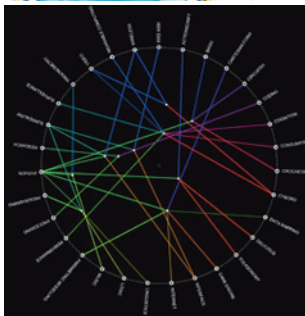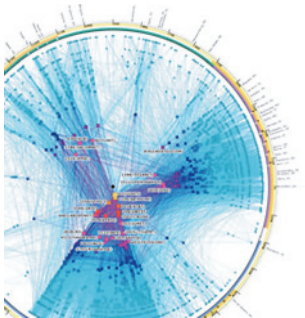


Two examples of work found at visualcomplexity.com, a resource for anyone interested in the visualization of complex networks. Interfaces studied here during the Winter quarter heavily influenced the approach of my project.

During this interim period I sketched several alternate layouts and looked into different organizational techniques such as the ones seen at visualcomplexity.com (http://www. visualcomplexity.com/vc/) and animation techniques at Levitated (http://www.levitated.net/). This research led to the eventual change from a three-dimensional space to a radial grid of information. This proved to be easier to program as well as much easier to understand and interact with.

Near the end of this period I also began to research major characters in comics and decided which to use in the project and the best information sources. I also gathered the source code for many elements that would later manifest in some shape or form in the life of the project, like the search mechanic, tweening functions, relationship drawing functions, internal scroll-bars, or arc drawing mechanics.

**Spring Research Report**

This quarter dealt mainly with the construction and testing of the project. Most of the interface research was completed and the layout was mostly decided. Source material was obtained for populating the database. Early weeks were spent coding and entering data into the database. After a few weeks, the interface was far enough along that other people could interact with it without fear of major errors, crashes, or a complete lack of understanding of what was going on.

From this point on, research was done only for the purpose of adding characters to the database or new features to the interface based on user testing. The major functions that I added after this point were a history list and an analysis of what has been viewed. For details on what was done during this time, refer to the Project Schedule section.

I developed most of the code in this project. For the search engine I initially used code from Actionscript.org (http://actionscript.org/tutorials/advanced/active_search_list/index.shtml) but modified it so drastically that it bears little resemblance to the original coding.

I researched the possibility of resizing a Flash object within a browser as well as drawing methods to dynamically create an arc. I downloaded this code from form = function (http://formequalsfunction.com/downloads/drawmethods.html) and modified it slightly to suit my needs.

Code that allows Flash to resize within the web browser to allow for variable text lengths came from Mustardlab (http://www.mustardlab.com/developer/flash/objectresize/).

I put information regarding each character together from Marvel Comics, DC Comics, Wikipedia, Spider-Bob's Comic Book Encyclopedia, *Marvel Characters* by Dan Jurgens, and *The DC Comics Encyclopedia* by Jimenez, Wallace, and Beatty. This information can be seen within the project by clicking on any character's name. There are eighty-one characters, each containing about one full page of information regarding their company, creators, origins, adventures, powers, weaknesses, and other facts.

I pulled imagery for each character from a variety of sources including: Spider-Bob's Comic Book Encyclopedia (http://www.spider-bob.com/), Wikipedia (http://www.wikipedia.org/), Marvel Comics (http://www.marvel.com/), and DC Comics (http://www.dccomics.com/).

**Project Definition**

Since the rise and integration of the computer in society, we have been obsessively digitalizing data on anything and everything. Databases of billions of pieces of interconnected information have become commonplace. What are we trying to do with all this information, and how are we supposed to process it? The most common method is just list everything alphabetically down a column and scan down the list looking for what you want. The other method is using a search engine to whittle the load down a bit and then examine the remaining information. A problem with both of these methods is that it is fairly difficult to find something that you know next to nothing about. There is also no sense of how this data is related to the surrounding information.

My project was a study on organizational form of large amounts of data within a limited space. I intended this tool to offer instant access to information and be interesting to browse. While my database does not have billions of entries, it does house over eighty characters from the world of American comics: enough to be daunting. I intended to provide specific information about individual characters, as well as show general concepts that exist within the data and deviations from these relationships. The interface itself acts not only as the method of delivering information but as a way of representing the nature of the data within the larger concept.

This project focuses on the fantasy realms of comics and science fiction, but need not be limited to mythology. It can be used with any sort of data from the major players in the Spanish Inquisition to experimental drug research, from film to file structure of a website. In this particular exploration, the audience is anyone who is enjoys escaping to the world of imagination and the characters that exist therein.

The database is built and optimized to work from a web browser on a home computer. The project is built using Macromedia Flash MX 2004. Each entry is represented by name and a color-coded cube that identifies the charater's category. Each character has a snazzy image, several paragraphs of information about their origins, powers, weaknesses, and exploits. Also brought to attention are characters that they have a relationship to, such as similar influences or author. It is intended that while learning more about characters the viewer is interested in, they discover new relationships of that character to other characters or better understand how they fit into the larger world of American comic mythology.

**Fall Schedule**
Week 1  *9-25-2006/10-1-2006*
Orientation.

Week 2  *10-2-2006/10-8-2006*
Research potential topics.

Week 3  *10-9-2006/10-15-2006*
Research potential topics.
Explore visual styles and techniques.

Week 4  *10-16-2006/10-22-2006*
Narrow topic down to mythology.
Begin define fundamental goals of the project.

Week 5  *10-23-2006/10-29-2006*
Research database techniques.
Narrow topic to ancient mythology.

Week 6  *10-30-2006/11-5-2006*
Initial sketching of the interface.
Outline of interface capabilities.
Create project definition.

Week 7  *11-6-2006/11-12-2006*
Revise topic to religious mythology.
Begin research on religious figures.
Populate database with core information.
Additional interface sketches.

stormy
environmental
gush
text
flow
three
dimensional

An early experiment in using a three-dimensional layout for the desing.

Week 8  *11-13-2006/11-19-2006*
Create sketch of icons for religious categories.
Create test three-dimension space for housing the data.
Continued research on religious figures.
Research MySQL techniques and searching functionality.
Additional interface sketches.

Week 9  *11-20-2006/11-26-2006*
Continued research on religious figures.
Create a simple search engine of the database to be later used to populate the Flash environment.
Refine icons.
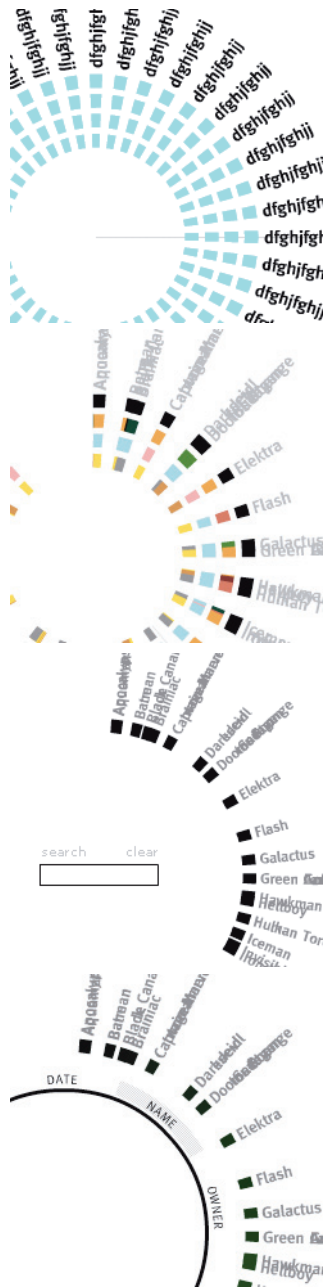Additional interface sketches.

Week 10   *11-27-2006/12-3-2006*
Outline of work to be done during the Winter Co-op.
Report of work accomplished during the Fall quarter.

**Winter Schedule**
January 2006
Search for imagery of religious figures.
Library research on several different faiths and their key figures.
Continued investigation of MySQL and how to communicate between a database and Flash.

February 2006
Drop religious mythology as a topic.
Create several new interface sketches.
Redefine project definition to be more concise and simplified.
Return to researching search engines and organization techniques.

March 2006
Narrow topic down to comics.
Outline database structure.
Explicitly define project capabilities.
Research of internal Flash search functionality.
Research of coding techniques.
Gather source material for imagery and database content.

**Spring Schedule**
Week 1 *3-16-2006/4-1-2006*
Progress meetings in class.
Create Spring schedule.
Begin code tests for optimal population of data and versatility.
Baseline code and outlining of variables and areas that will need further research.
Psuedo-coding of major functions within the code.
Rudimental interaction and functionality within a test environment.
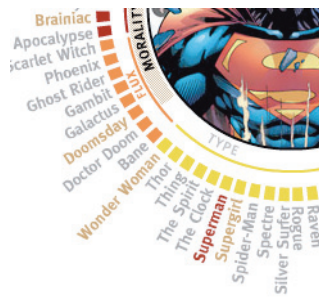Optimization of core functions and data structure.

Week 2 *4-2-2006/4-8-2006*
Progress meetings in class.
Node generation for entries and sorting functionality.
Initial database layout and importing data into the Flash environment.
Basic rollovers, filters, searching, and history functionality implimented.
Populate database with 5-10 entries.

Week 3 *4-9-2006/4-15-2006*
Removed history tracking functionality.
Complete overhaul of search engine from instantaneous to button of ENTER key activated.
Database increased from 10 to 30 characters.
Layout applied to Flash environment.
Two character images formatted to style and transitions created.
Filter sorting completed.
In-class presentation of progress.

Week 4 *4-16-2006/4-22-2006*
Filter rings simplified from four rings to a single ring.
Database increased from 30 to 60.
Images found for all characters.
Full information on each character entered into database.
Connections between characters added to database.
Functionality for visualizing character relationships added.
Fonts and formatting added to text field.
Accordion feature added for filters that leave entries in clusters rather than standard spacing.

The circular interface in different stages of development throughout the Spring Quarter. The topmost image is the earliest in the development cycle and each successive one is a newer version.

The final imagery of the title and the circular interface.

Week 5 *4-23-2006/4-29-2006*
Progress meetings in class.
Revised layout to be wider.
Added to more methods of filtering the content.
Removed internal scrolling and allowed the browser to handle the height.
Added a menu for access to help, copyright information, and returning to the introduction screen.
Created HTML index file.

Week 6 *4-30-2006/5-6-2006*
Moved the character image from the border to within the circle.
Created basic title.
Swapped circular form and text field positions.
Moved the key from below the circle to a ring between the image and the entries.
Database increased from 60 to 70.
New transition created for images within circle.
Removed character relationships.

Week 7 *5-7-2006/5-13-2006*
Revised the title.
Database increased from 70 to 80.
Key ring colors revised, build, and added to the environment.
A report on what has been viewed and additional information completed and added to the menu.
Optimization of code and functionality.

Week 8 *5-14-2006/5-20-2006*
Revised the history tracking from earlier and added it to the menu.
Replaced filler text in the menu choices with actual text.
Created a help interactive animation.

Week 9 *5-21-2006/5-27-2006*
Fixed a bug with flipping text fields while sorting data.
Increased database from 80 to 81.
Added images to all menu buttons.
Created rough introductory animation.
Slightly revised and improved circle button functionality.

Week 10 *5-28-2006/6-3-2006*
Added audio to buttons, sorting, and clicking.
Revised initial build to perform better and be more visually interesting.
Final color adjustments.
Added secret easter eggs to the search engine.
Added character relationships back into the environment.

**Project Testing**

Controlled demonstration of the project showed that there is too much visual information on screen at any point. The removal of all but one circle of colored squares allowed for the addition of new categories as well as a great improvement in understandability of relationships and a minor performance update. This change also allowed for greater stylization of transitional animations.

Direct user interaction showed that in clustered filter modes it became to difficult to make a selection or read what was available. The addition of transparency and an accordion animation of the information allowed for greater user understanding and resolved selection difficulties.

Perforamce analysis revealed several scripts that were being called unnecessarily and greatly hindering the performance of the file. Fixing this greatly improved speed and reliable functionality.

Since the project is based almost entirely in Flash, the browsers natural history capability is not available. Some users wished to review what they had been looking at and recall a state they were previously studying. Creating an internal history cache returned this feature to the user. Additionally, clicking entries in the history will return the tool to the same state as it was at the time, both character and filtration method.

Additional user interaction showed that the colored cubes frequently explored with the mouse cursor and sometimes clicked caused no response by the interface and frustrated or confused the user. Giving these the same functionality as the names of the characters improved the usability for a subset of users.

Testing in multiple browsers on different platforms lead to the discovery that some features did not always work as intended. One such case was when hitting *enter*, the project would reload rather than perform a search. This was corrected by trapping all keystrokes within the project and now works in all test cases. A second error discovered was that characters whose names contained non-standard characters, such as *Ra's al Ghul*, did not display an image in most Windows-based browsers. This was corrected using a character replace function within the Flash movie.

Differences in monitors and color spaces also appeared when testing on multiple computers. Some of the colors differentiating the categories blended together, thus appearing as a single category. It was also seen that the color of the selected character was too similar to the color of related characters, making it confusing to quickly look at the circle and discern the current focus.