10-22-2015

Visualizing Fantasy Fiction: Design of a Class in Digital Scholarship and Visualization, including Research, Organization and Digital Visualization, that Does Not Require Programming or IT support

Charles W. Kann
Gettysburg College

Follow this and additional works at: https://cupola.gettysburg.edu/csfac

Part of the Digital Humanities Commons, and the Graphics and Human Computer Interfaces Commons

Share feedback about the accessibility of this item.

Visualizing Fantasy Fiction: Design of a Class in Digital Scholarship and Visualization, including Research, Organization and Digital Visualization, that Does Not Require Programming or IT support

Abstract

This paper outlines a course to integrate digital visualizations into undergraduate research. These visualizations will include mapping and timelines of events, and the ability to hyperlink the events, characters, and story lines in a fantasy fiction story such as *Lord of the Rings* or *A Game of Thrones*. The digital scholarship will involve the methodology for collecting, organizing, and representing the data for the visualizations.

The topic for the visualizations in this paper is fantasy fiction; however the methods to develop these visualizations will be applicable to many academic disciplines, including the humanities and social sciences.

The paper outlines the justification for this class, the appropriate audience for this class, and the tools needed. Types of projects and homework assignments to implement the visualizations are suggested. It concludes with a syllabus outlining a typical schedule for this class.

Visualizing Fantasy Fiction: Design of a Class in Digital Scholarship and Visualization, including Research, Organization and Digital Visualization, that Does Not Require Programming or IT support.

Charles W. Kann
ckann@Gettysburg.edu

Abstract

This paper outlines a course to integrate digital scholarship and visualizations into undergraduate research. These visualizations will include mapping and timelines of events, and the ability to hyperlink the events, characters, and story lines in a fantasy fiction story such as *Lord of the Rings* or *A Game of Thrones*. The digital scholarship will involve the methodology for collecting, organizing, and representing the data for the visualizations.

The topic for the visualizations in this paper is fantasy fiction; however the methods to develop these visualizations will be applicable to many academic disciplines, including the humanities and social sciences.

The paper outlines the justification for this class, the appropriate audience for this class, and the tools needed. Types of projects and homework assignments to implement the visualizations are suggested. It concludes with a syllabus outlining a typical schedule for this class.

The development of material for this class is an ongoing process, and new materials will be posted to the author's web site as they are developed. Please contact the author, ckann@gettysburg.edu, for links, information, or to make comments and discuss the material in this paper.

The class described in this paper is being proposed as a first year seminar at Gettysburg College, but I am very interested in this class, and would be happy to discuss giving this class as an adjunct at any college or university in the Washington, Baltimore, or Central Pennsylvania area. I would be happy to discuss this class or assist any faculty or teachers at any high school, undergraduate, or graduate program interested in offering this or a similar class.

Introduction

In graduate school in the early 1990's I took a class that used Apple HyperCard for what today would be called *Digital Humanities*. The purpose of the class was to tell stories on the computer using multimedia presentations. Even at that time HyperCard supported sound, images, moving graphics, and even video. The class was offered in the Computer Science department because at that time no other department had the skills to really use these tools, but the faculty were working with other departments to create classes which would use multi-media in other disciplines. There was little doubt in the mind of anyone associated with this class that the adoption of multi-media in humanities and social sciences was, at most, only years away.

Fast forward over 20 years. The Internet has gone from something that was rare and used only by very technical people, to an integral part of most people's lives. The World Wide Web has gone from the text based browser named WorldWideWeb to something that can handle almost any imaginable media formats, and delivering content at speeds that were unimaginable 20 years ago. Web pages and social media, which were nonexistent, now dominate the lives of many people. Yet in spite of these advances, digital content in academic research products in the humanities and social sciences has not live up to its promise, and delivering on the promise of digital scholarships seems only to have faded further into the future.

Why academia continues to fail to deliver on the promise of digital content is an open question. The purpose of this class is to directly address this issue by presenting a class in Digital Scholarship built around students creating research products built on specific digital media to present visual results. A methodology is suggested to help students and faculty overcome the learning curve that is required when organizing data for visual presentations. Projects and tools to implement those projects, all within the ability of a typical high school student or undergraduate to implement, are suggested. The purpose is to develop a turn-key type class that teachers and faculty can offer, or a template that they can follow to implement classes that follow their own interests.

In a previous paper [1], a methodology for creating undergraduate research projects to include digital media was proposed. This paper will use that methodology to describe a course that will include a number of projects of projects using digital content. These projects will include multimedia sources such as images, sound, and video. But the projects also target specific ways to organize the research that allows the digital visualizations to be integrated directly into the research. Types of organization and visualization includes hyperlinked documents, timelines, maps, and integration of multiple formats. Examples of using multiple formats will include hyperlinks between event in times, timelines with maps (timemaps), and story arcs of characters and events.

The proposed class is a semester long and organized around sections which will present different ways to visualize research. Each section will have a topic that will include a format for visualizing the research (e.g. a timeline using Excel), use that visualization format to develop a research plan to create a final project using that visualization, do research on the topic using this research plan, organize the research, and implement the final research product in the assigned format. Visualizations created in this class will include:

1. Two projects using hyperlinked documents. A spreadsheet (such as Excel) will be used to help gather, store, and organize the research. The results will be presented first in PowerPoint and then HMTL.
2. Two projects to implement timelines of story events. Again a spreadsheet will be used to collect, store, and organize the information, and timelines generated using Excel templates and a Web based open source tool such as Simile. The Web based version will implement hyperlinks to describe the events.
3. Two interactive maps, the first implemented with image maps, and the second implemented using Story Arc to display related groups (such as alliances over time) on a map.
4. Other projects as time permits. These will use map and timeline software to display events on a map over time, or to follow story or character development.

As part of this research, a suite of tools called Story Arc is being developed. For more information about Story Arc software, please contact the author of this paper directly at ckann@gettysburg.edu.

The rest of this paper will describe the class in more detail. The topics of the paper will be:

1. The research topic of the class, which is fantasy fiction in general, and specifically the fictional series *A Song of Ice and Fire*[2], the basis for the HBO series *A Game of Thrones*, by George R.R. Martin.
2. The intended audience for this class, and a justification for why the material used in this class will be appropriate for this audience.
3. Technology resources that will be needed for this class.
4. An review of the methodology for developing the projects to create visualizations in this paper.
5. A syllabus with project descriptions. Over time as materials to go along with the class are developed, they will be posted to a web site maintained by the. Please contact the author for more information.

Why use Fantasy Fiction as a topic?

While many aspects of undergraduate scholarship in all fields of studies, including most Humanities and Social Sciences, have aspects that could easily and effectively integrate digital visualizations, this paper this paper will focus on the topic of Visualizing Fantasy Fiction. There are four reasons for choosing fantasy fiction.

The first reason for choosing fantasy fiction is the rich opportunities to apply digital visualizations. Fantasy fiction, such as Tokien's *Lord of the Rings*[3] or Martin's *A Game of Thrones*[2] (the basis for the HBO series *Game of Thrones*), is fiction which creates entire worlds, with complete geographies, histories, numerous characters with complicated personalities and complex relationships.   These complex, multi-volume works practically scream for visualizations to help understand these complexities. Many of these books already come with map inserts and tables of relationships between characters to aid the reader in understanding the story. But there are myriad of other visualizations, particularly using digital technology, that could make these books even more understandable.   Simple ideas such as timelines to represent events, or maps to show ever shifting alliances of realms or peoples, are obvious and low hanging fruit for digital visualization. Representing the events as both geographic and time data, using timemaps, or the progression of the characters through time offer even greater insight into the story. The ability to visualize the stories in so many different ways, and the effectiveness of these visualizations on the ability to understand the underlying story, makes digital visualization of fantasy fiction a good choice of subject area.

The second reason for choosing fantasy fiction is that the topic has the possibility of many good digital visualizations that could be used across many academic disciplines without tying this paper to any specific academic discipline. The techniques and visualizations that are developed apply equally well to many academic areas. However if the choice of topic for this paper were history (e.g. the battle of Gettysburg), the entire research could be seen as applying to a small area of historical visualization. Fantasy fiction is not a big area of research, and so should allow the readers to use their imagination as to how the visualizations and methods to create them could apply to their academic area.

The third reason for choosing fantasy fiction is that these works are very popular and have highly motivated and excited readers.   Populations of avid readers are already motivated to create many resources around these works[4][5], and many of these resources are digital visualizations of these works. This leads to many examples that can be referred to, or open source resources that can be applied in the class.

The last reason for choosing fantasy fiction is that the nearly cult like popularity of these works tends to draw students who will often be highly engaged with the background material in the class. This level of engagement with the topic will hopefully make the students excited to create content using the digital visualization methods that are taught in the class, and add to their engagement with the methodologies being taught. It is easier to teach topic that are fun and interesting to students.

Intended Audience

The intended audience for this course is undergraduate students, normally first year undergraduate students so that they can take advantage of the techniques they learn in this class for these rest of their academic career. In considering the audience, the overriding issue that was addressed in designing this class is the types of skills and background students will need to succeed in this class**. This class is designed to allow students with little or no programming background to succeed in finishing the projects.**

To understand why these projects should be within the ability of nearly all first year students, it is important to specify the type of skills that will be required from these students. From anecdotal evidence bases on my experience teaching freshman classes of CS for non-majors, all of the Peer Learning Assistances, other faculty who teach the class, students have little or no difficulty creating content that does not change, such as in Excel or HTML. Even content that has active interactions with the user, for example with image maps or time lines, is not difficult for students to develop, as the content itself does not change over time. This content that does not change over time will be called *static content*, and only requires the student to organize information.

What is difficult for students is any content that can be changed over time. This will be called *active content*. There are orders of magnitude difference in the students' ability to handle active content verses static content. Anything that requires logic, including simple sequences, is difficult. Even variable assignment, where variables can change value over time, are confusing to most students.

Understanding this difference between static content, which requires only organization, and active content, which requires some degree of procedural logic, is often ignored. This leads many non-programmers to say computer are hard, when in fact they use them to organized simple tasks all of the time. Taking into account that non-programs seem to have few problems with static content, and structuring the class around only static content, is why students with no programming background should be able to finish the material. In this class, only static representations of data, such as Excel tables, HTML, or XML, will be used for any of the projects.

Needed Technology and Resources

When designing this class, the technology resources needed for the projects needed to be chosen. Everyone knows that when dealing with IT, the expectation is that the tools will be expensive, proprietary, and hard to use.

In his class, a conscious effort was made to choose tools that are free or have free analogs, are readily available, and to the degree possible, are open source. The tools should work across most major platforms that might be encountered in an academic environment, including most versions of Windows, Mac, or Linux.

Because these tools are readily available or open source, there are a large number of tutorial and online help sites for using them. This removes the need for an expensive textbook to cover all the esoteric

information about how to use them. It also means that being able to use the tools and techniques covered in this class should be an easily transferable skill to other academic domains.

 The following is a list of all the tools which are needed.

1. HTML
2. XML
3. Excel and templates
4. PowerPoint
5. Story Arc (open source project being developed in conjunction with this class).

Methodology

One problem that occurs when trying to implement digital visualization is that data (such as dates, times, location coordinates, etc) must be gathered and organized in a consistent manner as part of the research process. This type of data is not normally formally collected as part of most research papers in the Humanities and Social Sciences, so integrating this type of collection and organization is new to most students. A previous paper[1] gives a methodology to facilitate including this information into a more formal research process. An overview of this process is repeated here.

1. Identify the research problem. This is a single sentence that describes the topic and bounds of the research. If this statement goes over a single sentence, or it there are multiple clauses in the sentence, the topic is likely too broad or represents more than one project. The purpose of this sentence is to focus and limit the research, and so it should be carefully crafted, and once written, material that falls outside of this sentence should not be included.

2. Create a short paper, called a *functional description*, that describes research. The functional description will provide the central question being with the research from step 1. It will continue with a section on data gathering, a section on data organization, and a statement on the tool which will be used to generate the final product.   While the functional description will be written to describe the project from start to finish, it will not be developed from start to finish. After the research problem is defined, the type of visualization(s) that will be generated in this research will be selected. A tool to create this visualization will be chosen. Based on the tool, the organization of the data will be defined (e.g. a spread sheet or XML document, etc.). The data that are needed will be defined, and the methodology for gathering the data will be specified. Once this is completed, the actual research design paper will be written.

3. The data is collected. Rather than using index cards, students will keep tract of notes in digital tools, normally a spreadsheet. If a book or article referenced is online, it might be possible to hyperlink directly to the source document and not have to copy the page and quote the data. If data values need to be collected and manipulated, tools like spreadsheets, that were made to collect and manipulate data sets, will be used. Pictures and images can be collected into directories or online photo albums, and referenced directly from the spreadsheet containing the research. All of the detail as to how to collect the data should have been describe in the functional specification, and this step is to just collect the data around the plan outlined in the function specification.

4. The data is organization. Once the initial data has been collected electronically, there are many of tools for organizing it around almost attribute. Data can be grouped by time, geospatial coordinates, themes, hyperlinks, photo albums, or just about any relationship that can be

imagined. Different organizations can be tried to see how that impacts the raw data. The final result should be data which is appropriate to generate the desired visualization.

5. The visualization is created. Once the data have been organized the final visualization is created. For example, timelines can be made, and pictures placed at appropriate points within that time line. Events can be placed on maps. Tables of characters actions can be created. All of these visualized data can supported by referring back to the original data collection and the source. Visualizations can be tweaked to add titles, and given context by inclusion in a research document, such as a web page.

Note that unorganized or haphazard methods of collecting data are not allowed. The final format of the data needs to be specified when starting the project, and that should generate the format and organization of the information that are gathered when researching the topic.

Syllabus

The following is a syllabus suggested for a 16 week semester. This syllabus is broken down into seven topics. Some are one week, but several will require multiple weeks to cover, and this will be noted in the syllabus.

# of weeks	Topic Name	Description	Assignment
1	Taking and organizing note in Excel	This topic covers how to enter data into Excel, and how to use Excel to organize it multiple ways by using techniques such as sorting and filtering	Creating and using an Excel Spreadsheet.
1	Implement hyperlinked documents in PowerPoint	This topic asks the students to read some part of the fantasy fiction selected for this class (e.g. "A Game of Thrones"). The students will choose 5 characters and 3 events in the book to document.	Create a PowerPoint document linking the events and characters.
2	Implement hyperlinked documents in HTML	This topic converts the PowerPoint document into an HTML document using links between pages about the characters and events.	Translate the second assignment from PowerPoint to HTML
1	Implement time lines using Excel templates	This topic has the students implement the events in the story into a time line using an Excel tool to generate time lines	Create Excel Time Line
2	Implement Web based Timelines	A Web based tool (such as Simile) will be used to take XML based information on events from the students and generate a web based time line with links to characters and events	Translate Excel Time Line to XML
2	Implement Web based maps with overlays using image maps.	Image maps will be used to generate a maps of the alliances between different houses in the game of thrones.	Image map of alliances
2	Implement Web based maps	Detailed maps with mapping software	Story Arc

	using a mapping tool as part of Story Arc	will be used to generate the maps of alliances between different houses in game of thrones.	implementation of alliances in game of thrones
5	Implement more complex visualization of the story using Story Arc software	Timemaps will be used to show time based events on the maps, and the story arc of several characters and story lines will be represented	Story Arc implement of story lines in the books.

References

[1] *Kann, Charles W.,* "Digital Scholarship: Applying Digital Tools to Undergraduate Student Research Papers, A Proposal for a Freshman Seminar. Part I: Definition of Student Research Methodology" (2014). *Computer Science Faculty Publications.* Paper 20.
http://cupola.gettysburg.edu/csfac/20

[2] Martin, George R.R.(*1996) A Game of Thrones*. New York: Bantam, 1996.

[3] Tolkien, J.R.R. (*1991). The Lord of the Rings. HarperCollins.*

[4] Johannson, E. (2013). LOTR Project. Retrieved October 11, 2015, from http://lotrproject.com/

[5] (2010). Retrieved October 10, 2015, from http://www.sermountaingoat.co.uk/