Creating a System for an Interactive Public Display on the Connecticut College Computer Science Department

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Introduction:

The adoption of Interactive Public Display Boards is rapidly increasing as people and communities are realizing the need for communal and simplistic ways to disseminate information. While user experience and the presentation of relevant information are the two main goals of these systems, it is clear that not all Interactive Display Boards accomplish this. This research is focused around combining the social science of Anthropology with the functionality of computer science to create an attractive, useful and informative display. Creating this system has epitomized the mission of liberal arts institutions; combining skills across very different departments to achieve a goal.

With user experience specifically in mind, the goal of my research is to create an interactive public display that allows current and prospective students to learn more about student research in the Connecticut College Computer Science department. The primary design goal of my research is to create a system that highlights the most notable student research projects and the secondary design goal is to create a system where all student research can be backlogged. The purpose for this project is to make the work of the department transparent and easily accessible to everyone interested in learning about it.

When setting up an interactive display there are a number of factors that need to be considered for the system to be effective. The ‘first click’ problem is the well documented phenomenon of struggling to engage people with the display [B]. This can happen when users either do not see the display or actively ignore it. Other possibilities for ignoring the display are when users don’t understand that the display can be clicked or are worried that if they touch the display they will break it. It is for this reason that Agamanolis stated, “half the battle in designing an interactive situated or public display is designing how the display will invite interaction” [A].

With initial interaction presenting such a difficult problem to overcome, it has become a major focus for my research.

Due to other research projects, the size and location of the display system were already determined, meaning that I must fit my design to fit this space. This monitor is going to be placed in main corridor of New London Hall (an academic building at Connecticut College). Surrounded by Computer Science classrooms and professors offices, this monitor will be passed by most Computer Science students. In addition to CS, New London Hall has courses taught in it for a wide variety of other departments, ranging from German to Biology. The hallway in which the monitor is placed is also on the path of every tour that perspective students are led on. This provides the unique opportunity to create a system that can reach both the department and students we are interested in recruiting.

With these two groups in mind, I am trying to create an interactive display that is easy enough for any user to utilize, while still presenting a meaningful amount of information for current CS students looking at their peer's work. After many mock-ups and user tests this system took took the form of a coverflow style, depicting information about all research projects. This style encourages physical interaction while also concisely presenting the wide array of research projects that students have completed. In order to create a system that is always current and can automatically be updated, my research also hopes to create an auto-filling template in which students who have conducted research can upload information about their research and the system automatically fits it to a uniform template.

This research project focuses on demystifying the CS department and providing a research tool for current students. Through an extensive mockup and testing process, the most effective system was decided upon which allows for a clean and clear coding step.

Problem Description:

Within the computer science department a huge amount of student research is completed. Each major is required to complete at least a year of research under the guidance of an advisor in the department. Unfortunately, after completion a lot of this research is forgotten and prospective students and prospective majors do not get to see the possibilities available to them if they came to Connecticut College and majored in Computer Science.

The goal of my research is to solve this accessibility issue through creating an interactive display system that will be accessible to students visiting Conn's campus. By creating a system focused on usability and that highlights some of the best research projects, the work of students is not forgotten and outsiders can gain more information about the CS department. At Connecticut College there is very little information available about departments. General information is discussed on tours, such as size, courses, and facilities but no information is given beyond that. Through creating an interactive display system, prospective students will be able to look beyond the basic information they are usually provided and can imagine what their education would be like if they came to Connecticut College. While creating this system is currently aimed at solving an issue that exists in the Computer Science department, it has applications across all disciplines. If an interactive public display highlighting student work existed in every department, visitors could gain a clear understanding of everything available at Connecticut College.

Related Works:

Creating an interactive public display requires content that users are interested in getting and a format that encourages engagement. The first step is getting users to see the display, the second is getting them to interact with it. This topic is one that many have dealt with and there is a great deal of information published on the topic. Hannu Kukka and his associates at University of Oulu specifically focused on what makes people interact with displays, and focused on

color/greyscale, animation/static, and icon/text in order to see what people responded most to [1].

Understanding the stages of interaction that people go through while interacting with a display is also critical to understanding how to get people to interact with your public display system. Looking at how audiences interact with large public displays in city centers, these stages of interaction are broken down into six stages [4]. These stages are, passing-by, viewing and reacting, testing with subtle interaction, direct interaction, multiple interaction, and follow-up actions [4]. These stages signify what type of actions the system is meant to encourage. In order to understand how people typically engage in public, I looked at a variety of studies that focus on this subject [2,10,11,12]. *Enticing People to Interact with Large Public Displays in Public Spaces*, focuses on the issue of embarrassment that many people feel when approaching a public display [7]. They focus on coming up with good design and improving the interaction experience in order to facilitate more interaction from users [7].

Since interaction is the main issue that designers face when creating a system that they want people to use, researchers have looked into different ways of attracting people to displays. Chained displays offer a unique way of presenting information [3]. Koppel and his colleagues at TU Berlin argue that flat screens are not immediately appealing to viewers and go unnoticed. This research exemplifies a common downfall that I was eager to avoid. This made me consider more interesting approaches and approach the project with the ability to easily add 3D and motion detection.

Understanding how researchers attempt to make ad-hoc multiplayer games on public display systems provides insight into how to make other public display systems intriguing for passersby [5]. The same type of insight can also be gained from seeing how people interact with tabletop systems [6]. Understanding the difference between how people react to public systems in different settings shows the variety of considers that need to be accounted for when creating the Connecticut College interactive public display. Marshall also notes the issues that

people have with feeling crowded or having their space impeded on by others around them, an issue that leads to people avoiding public displays [6].

General Methods:

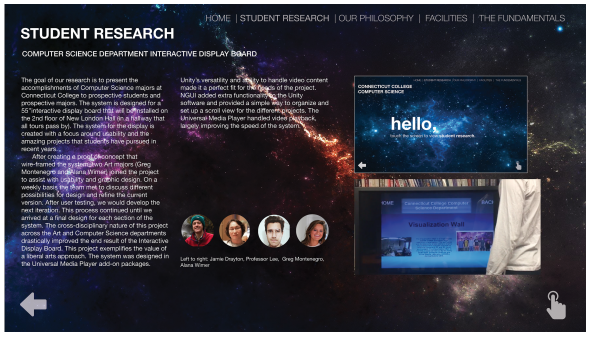
The methods involved to create this interactive display system was using the Unity Game Development Engine. Within Unity, I used the NGUI and Universal Media Player packages. NGUI adds a number of features to Unity, and Universal Media Player drastically improves video playback within Unity. With NGUI, I primarily used the pre-fab grid view, which provides a seamless and dynamic scrolling functionality for the student research section.

While Unity is a strong platform for design, video playback requires a large amount of processing power and, in turn, is very slow and costly. To counter this problem, I used Universal Media Player (UMP) which is an add-on package to Unity. UMP handles video playback with the ability to play videos that are internally saved or online.

The first step to creating the system was working towards wireframing the project and creating a proof of concept. This barebones model included all of the scripting and design features essential to the project, but was not focused on graphic design and usability. Once the proof of concept was completed, two Art majors joined the project to assist with artwork and user experience. Our methods in this phase consisted of brainstorming a few different ideas, creating them, and testing their usability and appeal on a 55'' touchscreen very similar to what will be installed in the hallway. By sitting 3 feet back from the screen we could get an accurate feel for what the interaction will be like on the final model. After testing, we would discuss our opinions and come up with a list of new possibilities for the next version. This methodology continued to the final version of the interactive public display.

Conclusion:

This research has surpassed the initial goals and has laid the groundwork for extensive future work. The interactive display board is currently open for use in the 2nd floor hallway of New London Hall (a hall that all tours pass by). Six student research projects, as well as three tabs that outline the goals of the Computer Science Department are available for interaction. Within the student research projects, there are images, headshots of contributors, a blurb of the project, as well as videos that begin playing when the projects are opened (see embedded image). The future work of the project is vast. A few of the primary goals are to create a system autofill student research pages when users upload the required information, create a demo mode that goals through different projects to attract passersby, extending the system to serve as a backlog for all student research, making the system available online, and lastly creating the foundation for the system to be used across the college by all interested departments.



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