A software development project of a 3D view of Southern Connecticut State University’s Buley Library

3D VIRTUAL MODEL

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# Section I: Problem Statement

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## **Objective & Deliverable:**

The SCSU campus covers about 168 acres and has many buildings. One of the most important buildings is the Buley Library. A major problem that students encounter is locating various study room and departments in the library. This project delivers a 360 virtual tour of the library’s interior, showcasing study rooms, Hoot Loot printer locations, IT Help Desk, Academic Success Center and other important departments and resources.

## **Motivation:**

This project helps current and incoming students along with the SCSU staff members locate these locations through a virtual tour. Students can control their navigation and spend time in the areas that are most relevant to them. With a virtual tour that has an interactive 360 map, embedded videos, and relevant information about the school, students have an experience that makes the school come alive in a new way.

## **Significance:**

This will be a virtual tool that will help save students a lot of time. Take a scenario whereby a student is planning to book a study room to prepare for their final exam in Buley. Instead of having to travel from their present location to come and ask for the room, they navigate the tour prior to their study hours and view where their rooms are located instead of wasting their time looking for the room. This saves them valuable time and money. The same scenario goes for finding departments. 

# Section II: Related Work

## **Alternative Software/Tools:**

​ For this project, we used a Theta Z1 360 Degree Spherical Camera with Dual 1" Sensors USA Model camera. This camera will allow us to capture 360 photos of Buley and allowed us to see clear images with high-performance angles. We also used the Kuula Software to connect all the pictures together and make it a virtual tour. To create the page, we used a combination of Notepad++ as well as Visual Studio code to create our website design. We used HTML, CSS, bootstrap, JavaScript and React to create this website. During development we hosted the website locally and posted our work on Github so that everybody on the team can work on the project. During development, we wanted to ensure that we were using the best and most secure software to store the images. After doing extensive research, we determined that Kuula was the most secure software to use for our images.

**User Benefit:**

By implementing 360 virtual tours our college now has the capacity to reach students on the other side of the country and can make the campus accessible to more students than ever before. 360 virtual tours make it possible to engage with students who ordinarily wouldn't be reached. It is far better than having a 2D model with less functionality. 360 tours can help students engage more with the content and have a better understanding of certain details about departments and colleges. Our goal is to provide an easy and accessible tool to all students in SCSU to see that library in a world where everything has moved to a more remote platform.

# Section III: Features

## 

## **Main Features:**

## The 360-tour experience provides an entire interactive experience for the users. The users have the capability of navigating to the website and seeing the tour. with users, they will be able to navigate wherever they choose to provide the users with an in-person experience. Webpage will provide the user with a seamless virtual experience. Links to guide the user and show them information about the library. These links can include descriptions related to areas of the library as well as contact information.

* **Rotate and Zoom Functions:**

The tour allows the user to zoom and span at their leisure and give attention to specific details. The user can move forward, backwards, and sideways within the frame. There is no limitation since there is a complete shot of all angles.

* **Side panel:**

The user can see a lists of all rooms and resources available on the floor they are viewing. The side panel provides direct links to related pages and allows the user to navigate back to the tour.

* **Hotspots:**

The tour hotspots provide an interaction for the users to click on to view additional information about a particular area within the tour such as the IT Help Desk or Academic Success Center.

* **Collapsible Taskbar:**

Our page has numerous options in the taskbar, and we wanted to ensure that users can use them regardless of the device they are seeing it on. To avoid having the users must look at s shrunk down version of the page or scroll over the page, we added CSS that will shrink that taskbar and group all the options underneath it, when presented on screens smaller than 500px.

* **Interactive Links:**

Throughout the page, the user will find numerous links for interactive links that pertain to Buley Library. We ensured that each link would redirect the user correctly as well as give the user a way to get back to the Tour Page.

# Section IV: Design Specification

## 

We created an environment for our team so that all members can work on their assigned pages and make updates to existing pages or documents needed for the project. To do this, we uploaded our page draft to GitHub here: <https://github.com/sotoh1/SCSU---CSC400>. Here we have uploaded all our pages.

**ER Diagram:** Diagram

Description automatically generated

The Navbar will contain a few options, which include Home, About, 360 Tour and finally Contact Info, here is a breakdown as to what will be found under each option.

* + **Home:** This button will be linked to the Buley Library homepage, providing a quick and straightforward way for the user to access other information regarding Buley Library not found on our page.
  + **About:** When the user clicks on this, there will be dropdown options such as Library information or Library Hours. Selecting one of these options will slide down the image slide show the user the information they selected. Other option to include here can include Library bulletins and resources. These dropdown values are subject to change to include other options as we further develop the project such as possibly adding a book information page and linking adding a link to it from this dropdown.
  + **360-Tour:** Selecting this option will give the user the option to select from each floor in the library. Clicking on one of these options will bring the user to the 360-tour page of that floor. These pages will contain a navbar containing information about the floor, what rooms can be found on that floor and contact info. This will be how each floor page will be constructed but can change as we further develop the site such as adding a Quick Link option that will anchor the use to a point in the tour that they specific however this will only happen if we have the time to create it
  + **Contact:** Much like the About dropdown, this will also push down the image slide show revealing contact information for the library. Options that can be made available here can include contact & phone information and the option to submit questions.

Our next steps will be to further develop these pages and decide on a standard design that we will use for all pages to keep the design consistent.

*Figure shows the sitemap.*

# Website GUI Plan (Updated)

# Homepage

|  |  |  |  |
| --- | --- | --- | --- |
| **NAV BAR** | | | |
| **Home**  -Clicking on this will bring the user to the SCSU Library Homepage | **About**  -Will show information portal about the library  - Hours  **-** Library Info  - Book info?  - Bulletins  - Resources | **360 Tour**  \*Clicking on this will bring the user to the 360 Tour page for the floor that was selected | **Contact Info**  -Contact & Phone Info  -Submit Questions |

|  |
| --- |
| * On open, this will show an automatic slide show of images taken at SCSU library * This area can change based on the user’s selection in the menu bar   + Hide show DIV for options that will show when About and Contact are selected |

|  |
| --- |
| **SCSU Footer with LOGO** |

# General Design for all 360 Tour Pages

|  |  |  |  |
| --- | --- | --- | --- |
| **SCSU Header** | | | |
| * Will include SCSU Owl logo as well as image of Buley Library, greeting will can say something like “Tour for floor ‘Floor Name’ ” | | | |
| **NAV BAR** | | | | |
| **Home**  -Clicking on this will bring the user to the Main 360 tour Homepage. | **About**  -Will show information portal about the floor currently being viewed | **Quick Link**  -Option to quickly find the room or floor the user needs to view | **Contact Info**  -Contact & Phone Info  -Submit Questions regarding this floor | |

|  |
| --- |
| * On open this will allow the user to start the tour of the floor * Selecting an option from About, Quick Links or Contact Info above will push this DIV down, making room dropdown options. * If a user selects an option in Quick Links, we will try to anchor that point in the tour to the option they selected and make it visible here |

|  |
| --- |
| **SCSU Footer with LOGO** |

## **ER Diagram:** Diagram Description automatically generated

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## **Class Diagram**

## 

## **User Interface Diagram**

# Section V: Implementation Details

## Software Components

## Required Tools and Technologies

## Timeline

# Section VI: Test Strategy Applied

## Unit Test

## Integration Test

## System Test

# Section VII: Discussion

## Unresolved Issues

## Limitations

## Future Directions

# Section VIII: Conclusion

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Appendix