Dahl Virtual Museum

Senior Design Final Documentation

Virtual Museum

Mackenzie Smith   Alex Nienhueser

December 18, 2015

Contents

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Overview Statements

0.1 Mission Statement

Mission statement inserted here.

0.2 Elevator Pitch

Elevator Pitch inserted here.

Document Preparation and Updates

Current Version [X.X.X]

Prepared By:
Team Member #1
Team Member #2
Team Member #3

Revision History

Date	*Author*	*Version*	*Comments*
2/2/12	*Team Member #1*	*1.0.0*	*Initial version*
3/4/12	*Team Member #3*	*1.1.0*	*Edited version*

1

Overview and concept of operations

The purpose of this project is to develop a virtual reality environment that accurately represents the Ruth Brennan art exhibit at the Dahl Arts Center. The end product will be able to be transported to and from the museum too allow students and others, who otherwise cannot visit the museum, to experience the Dahl.

The end goal for this particular project is to have the prototype gallery running through the Oculus Rift. This is so the Dahl Arts Center can get an accurate grasp of how this sort of technology will work and will inform their decision about whether to go further with the Oculus or not. This leads to another goal for the project team, research additional methods to utilize the virtual reality of the Oculus and give the Dahl a better understanding of what is feasible and what is fantasy.

The system that is going to be used for this project uses the Unreal Engine for the environment and the Oculus Rift for the virtual reality immersion. In order to allow users to experience this virtual gallery, there will have to be an operator who will know how to setup the Oculus and additional software for the tour to run efficiently.

1.1 Scope

The purpose of this document is to explain what pieces are going into this project, as well as how to install and run them.

1.2 Deliverables

1. Gallery room with art pieces and guided tour. This will be the finished product that is the main purpose for this project.

2. Research into other tour methods and ideas to help the Dahl think of different ways to bring their art center out into the community.

1.3 Purpose

The purpose of this product is to be able to take the Dahl Art Center out into the community so people who might otherwise be unable to see it, can do so. This particular project is a proof of concept that a virtual tour is possible and will be used as a basis for future projects.

1.3.1 Unreal Engine

The Unreal Engine is the main graphics engine behind the virtual tour. It was chosen of the Unity engine because of the level of control and detail that is necessary for rendering an art gallery.

1.3.2 Oculus Rift

The main virtual reality product that will be used to immerse the user in the gallery.

1.4   Systems Goals

Briefly describe the overall goals this system plans to achieve. These goals are typically provided by the stakeholders. This is not intended to be a detailed requirements listing. Keep in mind that this section is still part of the Overview.

1.5   System Overview and Diagram

Provide a more detailed description of the major system components without getting too detailed. This section should contain a high-level block and/or flow diagram of the system highlighting the major components. See Figure 1.1. This is a floating figure environment. LaTeX will try to put it close to where it was typeset but will not allow the figure to be split if moving it can not happen. Figures, tables, algorithms and many other floating environments are automatically numbered and placed in the appropriate type of table of contents. You can move these and the numbers will update correctly.
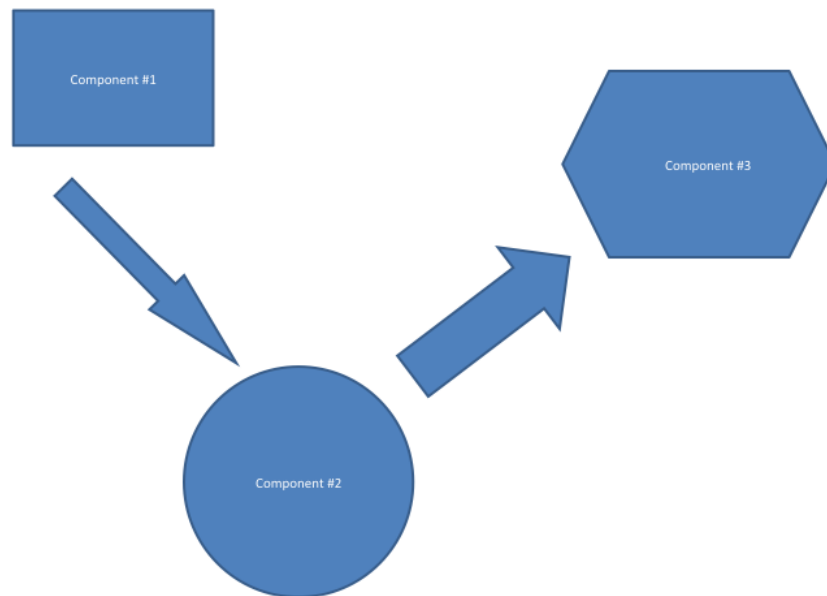
Figure 1.1: A sample figure .... System Diagram

1.6   Technologies Overview

This section should contain a list of specific technologies used to develop the system. The list should contain the name of the technology, brief description, link to reference material for further understanding, and briefly how/where/why it was used in the system. See Table 1.1. This is a floating table environment. LaTeX will try to put it close to where it was typeset but will not allow the table to be split.

Table 1.1: A sample Table ... some numbers.

7C0	hexadecimal
3700	octal
11111000000	binary
1984	decimal

2

Project Overview

This section provides some housekeeping type of information with regard to the team, project, etc.

2.1 Team Members and Roles

Describe who was involved and what role(s) were played.

2.2 Project Management Approach

This section will provide an explanation of the basic approach to managing the project. Typically, this would detail how the project will be managed through a given Agile methodology. The sprint length (i.e. 2 weeks) and product backlog ownership and location (ex. Trello) are examples of what will be discussed. An overview of the system used to track sprint tasks, bug or trouble tickets, and user stories would be warranted.

2.3 Phase Overview

If the system will be implemented in phases, describe those phases/sub-phases (design, implementation, testing, delivery) and the various milestones in this section. This section should also contain a correlation between the phases of development and the associated versioning of the system, i.e. major version, minor version, revision.

2.4 Terminology and Acronyms

Provide a list of terms used in the document that warrant definition. Consider industry or domain specific terms and acronyms as well as system specific.

3

User Stories, Requirements,Backlog and Deliverables

3.1 Overview

This documents will cover the Dahl Virtual Reality Museum Prototype. The document will give an insight to different aspects to the project. It is cropped into sections to focus on the projects design, unit testing, development environment, documentation, setup, and the customers. Through these sections it allows displays the structure the project has and the needs that it fulfills.

3.1.1 Scope

This document will cover stakeholder information, initial user stories, system requirements, proof of concept results, and various research.

3.1.2 Purpose of the System

The purpose of the Virual Reality Gallary is to allow other to experience the Dahl Art Mueseum without going to the physical location, as well as preserving select gallaries.

3.2 Stakeholder Information

This section would provide the basic description of all of the stakeholders for the project. Who has an interest in the successful and/or unsuccessful completion of this project?

3.2.1 Customer or End User (Product Owner)

Who? What role will they play in the project? Will this person or group manage and prioritize the product backlog? Who will they interact with on the team to drive product backlog priorities if not done directly?

3.2.2 Management or Instructor (Scrum Master)

Who? What role will they play in the project? Will the Scrum Master drive the Sprint Meetings?

3.2.3 Investors

There are no current investors in this project

3.2.4 Developers –Testers

The developers for this project consist of Alex Nienhueser and Mack Smith. They are both Computer Science Majors from SDSMT.

3.3   Business Need

The Virtual Reality Gallery will fufill the need of portability. An art museum such as the Dahl has a difficult time bringing art to those own can't come to their premises. With this project the Dahl will be able to take an entire gallery outside of their current location.

3.4   Requirements and Design Constraints

The constrants of this project lays only in obtaining a finished product.

3.4.1   System Requirements

The minimum system requirements for this project will be:
    NVIDIA GTX 970 / AMD 290 equivalent or greater with Intel i5-4590 processor equivalent or greater. 8GB+ RAM.

3.4.2   Network Requirements

There will be no need for network connection for this project. Network connectivity will not affect the Virutal Reality Gallery.

3.4.3   Development Environment Requirements

The Develope requires windows 7 or newer.

3.4.4   Project Management Methodology

The stakeholders might restrict how the project implementation will be managed. There may be constraints on when design meetings will take place. There might be restrictions on how often progress reports need to be provided and to whom.

- What system will be used to keep track of the backlogs and sprint status?
- Will all parties have access to the Sprint and Product Backlogs?
- How many Sprints will encompass this particular project?
- How long are the Sprint Cycles?
- Are there restrictions on source control?

3.5   User Stories

3.5.1   User Story #1

Does the first user story need some division into smaller, consumable parts by the reader? This does not need to go to the level of actual task definition and may not be required.

3.5.2   User Story #2

As a user I will be able to select between a guided tour and user-controlled experience the latter will be controlled using a handheld game controller.

3.5.3   User Story #3

This product should be able to be transported to make it able to take to other locations and allow people who might otherwise be able to experience the Dahl.

3.5.4   User Story #4

As a user I will be able to view an art piece and have a description text box appear on the side of the piece with interpretive text about the piece in view. There should also be the ability to add a short video to play on specific exhibits to add further description for the user.

3.5.4.a   User Story #4 Breakdown

Text should be provided by the Dahl to ensure customer satisfaction.

3.6   Research or Proof of Concept Results

This section is reserved for the discussion centered on any research that needed to take place before full system design. The research efforts may have led to the need to actually provide a proof of concept for approval by the stakeholders. The proof of concept might even go to the extent of a user interface design or mockups.

3.7   Supporting Material

This document might contain references or supporting material which should be documented and discussed either here if appropriate or more often in the appendices at the end. This material may have been provided by the stakeholders or it may be material garnered from research tasks.

4

Design and Implementation

The Dahl Virtual Museum project will be done entirely in the Unreal Engine 4.0 using the built in Blueprint system (a visual scripting IDE). Any code that will have to be written will be done in C/C++ and integrated into the Blueprint system.

This section will detail the different aspects of the Blueprints that will constitute the code of this project. There will be screenshots of the blueprints of each aspect of the project, which are: movement(free and on-rails), the room, the paintings, text descriptions, and alternate environments.

4.1   Movement

4.1.1   Technologies Used

Unreal Engine 4.0 Blueprint system

4.1.2   Component Overview

1. Free movement

2. On-rail movement

4.1.3   Phase Overview

This component was finished in phase 1, during sprint 3.

4.1.4   Architecture Diagram

Free Movement

User controlled input ⟹ Movement in the gallery

Movement function

On Rails

Lerp function called

Left or Right key is pressed ⟹ Movement to left or right painting
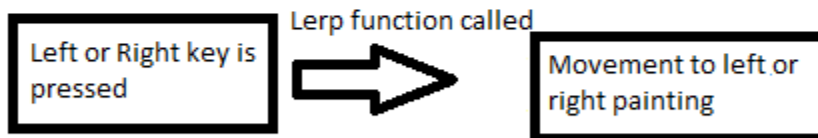
4.1.5   Data Flow Diagram

It is important to build and maintain a data flow diagram. However, it may be that a component is best described visually with an architecture diagram.

4.1.6   Design Details

Movement is a very crucial piece of this project, which is the reason there was two different methods developed. Both methods were beta tested by multiple people and showed that they were very much on track of what is required.

4.2   Paintings

4.2.1   Technologies Used

Unreal Engine 4.0 Blueprint system

4.2.2   Component Overview

1. Paintings were received as .jpg files

2. Image files then converted to .png

3. Drag and drop .png files onto objects in Unreal editor

4.2.3   Phase Overview

I'm not exactly sure what to put for this or any of the phase overviews

4.2.4 Architecture Diagram
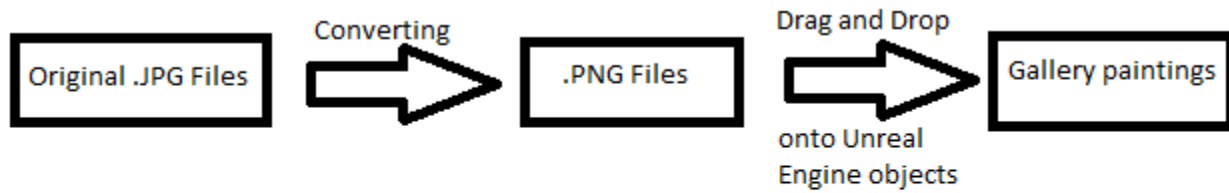
4.2.5 Design Details

This was a tedious process due to the fact that every file had to be converted from .jpg to .png in order for them to work in the engine. Then was the task of making the objects in the right dimension for each painting which was done by making box objects to scale with the width and height of each painting, then dragging the .png file onto the object itself thereby creating the texture.

4.3 Gallery

4.3.1 Technologies Used

Unreal Engine 4.0 Measuring Tape

4.3.2 Component Overview

The gallery itself was fairly easy to generate. A blueprint of the actual room was provided by the Dahl and make rendering the Unreal Engine as simple as make the right sized objects. The four outer walls were very easy to generate from the blueprint, the two protruding walls had to be measured by hand. The rounded corners however were more difficult to recreate because there are no rounded walls in the Unreal Engine, so they had to be custom made.

4.3.3 Phase Overview

This is an extension of the Phase Overview above, but specific to this component. It is meant to be basically a brief list with space for marking the phase status.

4.3.4   Architecture Diagram
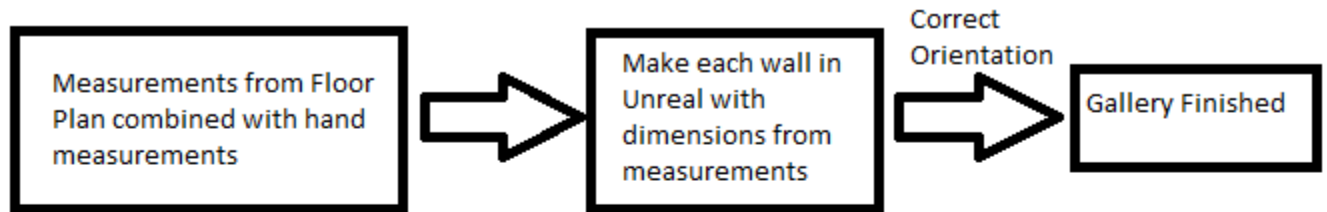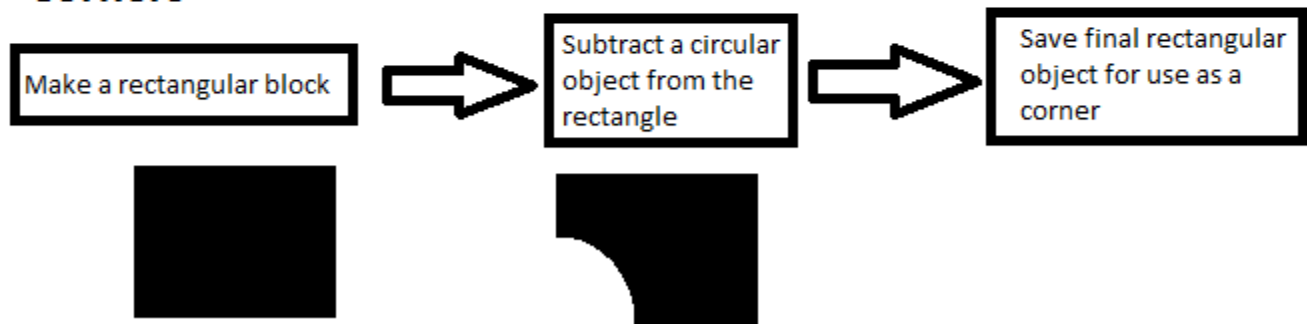
4.3.5   Design Details

This section is about how the actual room was recreated in the Unreal Engine. The Dahl provided a blueprint of the room which gave the dimensions and angles of the corners which was helpful in mapping it into the engine. A measuring tape was used for the standalone walls that protrude into the room and the measurements were then scaled to the Unreal Engine unit system.

5

System and Unit Testing

This section describes the approach taken with regard to system and unit testing.

5.1 Overview

Provides a brief overview of the testing approach, testing frameworks, and general how testing is/will be done to provide a measure of success for the system.

5.2 Dependencies

Describe the basic dependencies which should include unit testing frameworks and reference material.

5.3 Test Setup and Execution

Describe how test cases were developed, setup, and executed. This section can be extremely involved if a complete list of test cases was warranted for the system.

6

Development Environment

The basic purpose for this section is to give a developer all of the necessary information to setup their development environment to run, test, and/or develop.

6.1 Development IDE and Tools

Describe which IDE and provide links to installs and/or reference material.

6.2 Source Control

Which source control system is/was used? How was it setup? How does a developer connect to it?

6.3 Dependencies

Describe all dependencies associated with developing the system.

6.4 Build Environment

How are the packages built? Are there build scripts?

6.5 Development Machine Setup

If warranted, provide a list of steps and details associated with setting up a machine for use by a developer.

7

Release – Setup – Deployment

This section should contain any specific subsection regarding specifics in releasing, setup, and/or deployment of the system.

7.1 Deployment Information and Dependencies

Are there dependencies that are not embedded into the system install?

7.2 Setup Information

How is a setup/install built?

7.3 System Versioning Information

How is the system versioned?

8

User Documentation

This section should contain the basis for any end user documentation for the system. End user documentation would cover the basic steps for setup and use of the system. It is likely that the majority of this section would be present in its own document to be delivered to the end user. However, it is recommended the original is contained and maintained in this document.

8.1 User Guide

The source for the user guide can go here. You have some options for how to handle the user docs. If you have some `newpage` commands around the guide then you can just print out those pages. If a different formatting is required, then have the source in a separate file `userguide.tex` and include that file here. That file can also be included into a driver (like the senior design template) which has the client specified formatting. Again, this is a single source approach.

8.2 Installation Guide

8.3 Programmer Manual

9

Class Index

9.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

10

Class Documentation

10.1   Poly Class Reference

Public Member Functions

- Poly ()
- ∼Poly ()
- int myfunction (int)

10.1.1   Constructor & Destructor Documentation

10.1.1.a   Poly::Poly (   )

My constructor

10.1.1.b   Poly::∼Poly (   )

My destructor

10.1.2   Member Function Documentation

10.1.2.a   int Poly::myfunction (int a)

my own example function fancy new function
   new variable
   The documentation for this class was generated from the following file:

- hello.cpp

11

Business Plan

11.1 Business Model

11.2 Market and Competition

11.3 Regulatory environment

11.4 Intellectual Property and Freedom to Operate

11.5 Management Team and Advisors

11.6 Sources and Uses of Capital

11.7 Financial Statements

11.8 Metrics and Milestones

11.9 Exit Plan

12

Experimental Log

For research projects one needs to keep a log of all research/lab activities.

10/15/15 Ran modified filter on data sets 1 - 6. Results were ...

10/17/15 Changed tolerance on sensor and collected data. These ...

13

Research Results

This chapter describes the results and conclusions of your research. This would be the final report for a research project.

13.1 Result 1

13.2 Result 2

13.3 Conclusions

13.4 Further work

Bibliography

[1] R. Arkin. *Governing Lethal Behavior in Autonomous Robots*. Taylor & Francis, 2009.

[2] Howie Choset, Kevin M. Lynch, Seth Hutchinson, George A Kantor, Wolfram Burgard, Lydia E. Kavraki, and Sebastian Thrun. *Principles of Robot Motion: Theory, Algorithms, and Implementations*. MIT Press, Cambridge, MA, June 2005.

[3] S. M. LaValle. *Planning Algorithms*. Cambridge University Press, Cambridge, U.K., 2006. Available at http://planning.cs.uiuc.edu/.

[4] V. Lumelsky and A. Stepanov. Path planning strategies for point mobile automation moving amidst unknown obstacles of arbirary shape. *Algorithmica*, pages 403–430, 1987.

[5] S.A. NOLFI and D.A. FLOREANO. *Evolutionary Robotics: The Biology, Intelligence, and Technology of Self-Organizing Machines*. A Bradford book. A BRADFORD BOOK/THE MIT PRESS, 2000.

[6] Wikipedia. Asimo — Wikipedia, the free encyclopedia. `http://upload.wikimedia.org/wikipedia/commons/thumb/0/05/HONDA_ASIMO.jpg/450px-HONDA_ASIMO.jpg`, 2013. [Online; accessed June 23, 2013].

SDSMT SENIOR DESIGN
SOFTWARE DEVELOPMENT AGREEMENT

This Software Development Agreement (the "Agreement") is made between the SDSMT Computer Science

Senior Design Team ___Virtual Museum Tour___ ,

<center>("Student Group")</center>

consisting of team members ___Alex Nienhueser, Mackenzie Smith___ ,

<center>("Student Names")</center>

and Sponsor ___Dr. King Adkins, Dahl Arts Center___ ,

<center>("Company Name")</center>

with address: ___713 7th St, Rapid City, SD 57701___ .

[Note: Bracketed material is included to suggest content that will vary with each agreement. I STRONGLY SUGGEST THAT THE INSTRUCTOR LOOK AT THE COMPLETED AGREEMENT BEFORE YOU SIGN IT!!]

1   RECITALS

1. Sponsor desires Senior Design Team to develop software [for use in Sponsor's simulation platform for optical fiber transmissions of digitized video signals] (the "Field").

2. Senior Design Teams willing to develop such Software.

NOW, THEREFORE, in consideration of the mutual covenants and promises herein contained, the Team and Sponsor agree as follows:

2   EFFECTIVE DATE

This Agreement shall be effective as of ___September 30th 2015___ (the "Effective Date").

3   DEFINITIONS

1. "Software" shall mean any Unreal Engine environment developed by the senior design team as well as any code implementing the Oculus Rift in the Unreal Engine.

2. "Acceptance Criteria" means the written technical and operational performance and functional criteria and documentation standards set out in the project overview (attachment A).

3. "Acceptance Date" means the date for each Milestone when all Deliverables included in that Milestone have been accepted by Sponsor in accordance with the Acceptance Criteria and this Agreement.]

4. "Deliverable" means a deliverable specified in the project overview.

5. "Delivery Date" shall mean, [with respect to a particular Milestone,] the date on which University has delivered to Sponsor all of the Deliverables [for that Milestone] in accordance with the project overview and this Agreement.

6. "Documentation" means the documents, manuals and written materials (including end-user manuals) referenced, indicated or described in the project overview or otherwise developed pursuant to this Agreement.

<center>1</center>

7. "Milestone" means the completion and delivery of all of the Deliverables or other events which are included or described in the project overview scheduled for delivery and/or completion on a given target date; a Milestone will not be considered completed until the Acceptance Date has occurred with respect to all of the Deliverables for that Milestone.

4   DEVELOPMENT OF SOFTWARE

1. Senior Design Team will use its best efforts to develop the Software described in the project overview. The Software development will be under the direction of or his/her successors as mutually agreed to by the parties ("Team Lead") and will be conducted by the Team Lead. The Team will deliver the Software to the satisfaction of the course instructor that reasonable effort has been made to address the needs of the client. The Team understands that failure to deliver the Software is grounds for failing the course.

2. Sponsor understands that the Senior Design course's mission is education and advancement of knowledge, and, consequently, the development of Software must further that mission. The Senior Design Course does not guarantee specific results or any results, and the Software will be developed only on a best efforts basis. The Software is considered PROOF OF CONCEPT only and is NOT intended for commercial, medical, mission critical or industrial applications.

3. The Senior Design instructor will act as mediator between Sponsor and Team; and resolve any conflicts that may arise.

5   CONSULTATION AND REPORTS

1. Sponsor's designated representative for consultation and communications with the Team Lead shall be

   _____Dr. King Adkins_____ or such other person as Sponsor may from time to time designate to the Team Lead ("Designated Representative").

2. During the Term of the Agreement, Sponsor's representatives may consult informally with course instructor regarding the project, both personally and by telephone. Access to work carried on in University facilities, if any, in the course of this Agreement shall be entirely under the control of University personnel but shall be made available on a reasonable basis.

3. The Team Lead will submit written progress reports. At the conclusion of this Agreement, the Team Lead shall submit a comprehensive final report in the form of the formal course documentation at the conclusion of the Senior Design II course.

6   CONFIDENTIAL INFORMATION

1. The parties may wish, from time to time, in connection with work contemplated under this Agreement, to disclose confidential information to each other ("Confidential Information"). Each party will use reasonable efforts to prevent the disclosure of any of the other party's Confidential Information to third parties for a period of three (3) years after the termination of this Agreement, provided that the recipient party's obligation shall not apply to information that:

   (a) is not disclosed in writing or reduced to writing and so marked with an appropriate confidentiality legend within thirty (30) days of disclosure;

   (b) is already in the recipient party's possession at the time of disclosure thereof;

   (c) is or later becomes part of the public domain through no fault of the recipient party;

   (d) is received from a third party having no obligations of confidentiality to the disclosing party;

(e) is independently developed by the recipient party; or

(f) is required by law or regulation to be disclosed.

2. In the event that information is required to be disclosed pursuant to subsection (6), the party required to make disclosure shall notify the other to allow that party to assert whatever exclusions or exemptions may be available to it under such law or regulation.

7 INTELLECTUAL PROPERTY RIGHTS

No claim will be made to any algorithms or software developed during the course of this project.

8 WARRANTIES

The Senior Design Team represents and warrants to Sponsor that:

1. the Software is the original work of the Senior Design Team in each and all aspects;

2. the Software and its use do not infringe any copyright or trade secret rights of any third party.

No agreements will be made beyond items (1) and (2).

9 INDEMNITY

1. Sponsor is responsible for claims and damages, losses or expenses held against the Sponsor. [Sponsor may have something to add here.]

2. Sponsor shall indemnify and hold harmless the Senior Design Team, its affiliated companies and the officers, agents, directors and employees of the same from any and all claims and damages, losses or expenses, including attorney's fees, caused by any negligent act of Sponsor or any of Sponsor's agents, employees, subcontractors, or suppliers.

3. NEITHER PARTY TO THIS AGREEMENT NOR THEIR AFFILIATED COMPANIES, NOR THE OFFICERS, AGENTS, STUDENTS AND EMPLOYEES OF ANY OF THE FOREGOING, SHALL BE LIABLE TO ANY OTHER PARTY HERETO IN ANY ACTION OR CLAIM FOR CONSEQUENTIAL OR SPECIAL DAMAGES, LOSS OF PROFITS, LOSS OF OPPORTUNITY, LOSS OF PRODUCT OR LOSS OF USE, WHETHER THE ACTION IN WHICH RECOVERY OF DAMAGES IS SOUGHT IS BASED ON CONTRACT TORT (INCLUDING SOLE, CONCURRENT OR OTHER NEGLIGENCE AND STRICT LIABILITY), STATUTE OR OTHERWISE. TO THE EXTENT PERMITTED BY LAW, ANY STATUTORY REMEDIES WHICH ARE INCONSISTENT WITH THE PROVISIONS OF THESE TERMS ARE WAIVED.

10 INDEPENDENT CONTRACTOR

For the purposes of this Agreement and all services to be provided hereunder, the parties shall be, and shall be deemed to be, independent contractors and not agents or employees of the other party. Neither party shall have authority to make any statements, representations or commitments of any kind, or to take any action which shall be binding on the other party, except as may be expressly provided for herein or authorized in writing.

11 TERM AND TERMINATION

1. This Agreement shall commence on the Effective Date and extend until the end of classes of the second semester of Senior Design (CSC 467), unless sooner terminated in accordance with the provisions of this Section ("Term").

2. This Agreement may be terminated by the written agreement of both parties.

3. In the event that either party shall be in default of its materials obligations under this Agreement and shall fail to remedy such default within thirty (30) days after receipt of written notice thereof, this Agreement shall terminate upon expiration of the thirty (30) day period.

4. Any provisions of this Agreement which by their nature extend beyond termination shall survive such termination.

12 GENERAL

1. This Agreement constitutes the entire and only agreement between the parties relating to the Senior Design Course, and all prior negotiations, representations, agreements and understandings are superseded hereby. No agreements altering or supplementing the terms hereof may be made except by means of a written document signed by the duly authorized representatives of the parties.

2. This Agreement shall be governed by, construed, and enforced in accordance with the internal laws of the State of South Dakota.
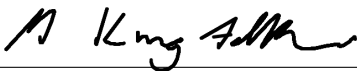
13 SIGNATURES

_____   10/15/15
Mackenzie Smith 10/6/15

_____   10/15/15
Alex Nienhueser 10/6/15

_____   10/6/15
Dr. King Adkins 10/6/15

A

Product Description

The product being designed in this project will be a virtual reality museum tour of an art gallery from the Dahl Arts Center. The gallery will be the Ruth Brennan Gallery featuring works from artist Arthur Amiotte. The gallery will be recreated in the Unreal Engine using an Oculus Rift DK2 for virtual reality support.

There will be two different tour choices, free movement (meaning the user can move around the gallery freely), and on-rails where the user can move between predetermined points. Movement will be controlled by either mouse and keyboard or by using an Xbox 360 wired controller, depending on user preference.

There will also be text descriptions of each art piece that will be able to be viewed. These will be interpretive descriptions written by the artist himself and will be placed along with the corresponding art piece.

NOTE: *This is part of the contract.*

B

Publications

Research Track: This chapter will include any publications generated from the research. Most likely these will be preprints and one will just include the pdf.

C

Sprint Reports

1 Sprint Report #1

Team Overview

Members

Mackenzie Smith, Alex Nienhueser

Project Title

Dahl Virtual Museum Tour

Company

Dahl Arts Center

Customer Overview

Customer Description

The Dahl Arts Center is the main source of paintings, sculptures, and other forms of made or found art in Rapid City.

Customer Problem

The problem that the Dahl has is it's lack of community outreach. It can be hard for children and students in lower income areas, especially on reservations, to come and visit the Dahl. They need a method for bringing the art out into the community without compromising the actual art pieces.

Customer Needs

- A virtual recreation of an art gallery (to be determined by the Dahl)

- A guided tour of the art gallery

- Simple menu system to choose which type of tour (guided, or free-moving if finished)

Project Overview

Phase 1

The first phase will be getting the guided tour operational. This is the main product that the Dahl wants, so it is the top priority. Other research or features will come in phase 2 after the main product is finished.

Phase 2

Here will be where most of the additional features will be implemented based on how much time is allowed. Things like: alternate environments, free-moving tours, and other ideas yet to be thought of.

Project Environment

Project Boundaries

- Will only encompass one art gallery
- Any movement restraints to reduce nausea

Project Context

- Gallery room will be developed using the Unreal Engine
- Virtual reality portion will be accomplished through the Oculus Rift

Deliverables

Phase 1

- Art gallery room
- Virtual reality guided tour

Phase 2

- Free-moving tour
- Alternate environments
- Research into future additions to product

Backlog

- VR integration with Unreal Engine
- Finalized gallery room
- Art pieces to put into gallery

- Narration done by Dahl integrated into guided tour

- Alternate environments

- Free-moving integration

- Research into possible additions in the future

Sprint Report

Work Accomplished

- Rough draft of gallery room

- Software contract (unsigned for now)

- Overview and requirements documents

- Begining work with Oculus Rift

Work Left

- User documentation

- VR integration with gallery room

- Finalize gallery room with textures and art pieces

- Guided tour system with narration

- Free-moving tour

- Research