AUT UNIVERSITY

DIGITAL CANVAS

Mid-semester Status Report

Semester One, 2015

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Contents

1. Project Description

1.1 Project Overview

Digital canvas is an interactive art project where the public can use hand gestures to manipulate a video stream of live performances. Each interaction will produce a short video clip that is then played back onto the large interactive screen for audiences to watch. As more interactions are recorded the videos are blended together and played back on loop to create a visual aesthetic.

1.2 Project Configuration

The project only runs on Macintosh Machine with Mac OS. The Microsoft Kinect is to capture the hand gesture as well as the Webcam is to display images on the screen. It was programmed in openFrameworks, Xcode.

Figure1: Retrieved from https://vimeo.com/80755572

1.3 Approach

1.3.1 Agile Methodology

Srum is the main methodology for our software development so that we can provide our client with fast iterations of functional software releases. User Stories were setup to capture all the requirements from our client along with the acceptance tests for validation and story points to arrange the priority of tasks during planning. In each sprint we had daily stand-up meeting to figure out if we had any updates to share, as well as sprint backlogs to identify the tasks necessary to complete for each user story. Followed by a burn down chart which will constantly updated to keep up to date with the timeline.

1.3.2 Analyzing Technique

UML Class Diagram has been used to analyze the structural information of the existing code given by the client. We have created a UML class diagram to understand the behavior of each class.

1.4Milestones

1.4.1 Semester 1 2014 Milestone

First of all, we demonstrated a simple working version of the software to our client at the end of each two-week sprint. We also updated the project backlog and had group meetings to plan the next sprint and sprint retrospectives to monitor the progress we made.

1.4.2 Holiday Milestone

We solved the potential bug where the user interaction with the system would stop sometimes. Some of the delay issues when creating a mask and manipulating the canvas have also been resolved. The software now runs stably and smoothly.

1.5 End Project Plan

Description of Completed Product

The final product will be a software package that can be deployed onto a computer (iMac) setup for the Digital canvas project at Aotea Center. The software will be operating for 24/7 using a Microsoft Kinect, which will capture hand movements as 3D gesture recognition that will be displayed onto the large display monitor in the center.

The computer is in a secure room and cannot be directly used by the public, and there is no onsite technical support. In order to maintain the software to be stable at all times, and in the event of a technical issue, it needs to be able to start up automatically on reboot without any configuration.
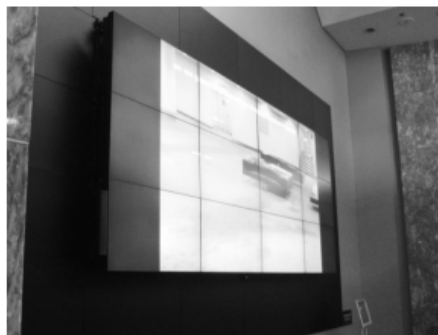
Figure 2: Image from "Digital Art Live (DAL) technical manual

2. Project Status

2.1 Current Status

After our team leader, Evan Martin, left the team as he has graduated, we continued to work on the project over the summer holidays. After working on our project on our Mac Books individually we would arrange to meet twice each week at our client's lab (WT1001) to test it.

Our development platform has been successfully set up on Mac. We have worked on the software code so now the program can record user interactions within the mask and also play it back. However if we do not set the parameters and coordinates prior to playback, the recorded mask will display on full screen.

2.2 Remaining work

We must figure out how to set up the recorded mask to playback automatically with the same parameters and on the coordinates it was originally recorded on. Once we sort this out we will develop the software to:
- allow creation and blending of multiple mask interactions
- recognize 'older' masks and fade them out slowly
Once these key tasks are complete we will discuss with our client and add any extra features at this time if required. Then we may alter the resolution of the software to match the screen panel measures and resolution of the Aotea Centre interactive screen.

2.3 Project issues

2.3.1 Contribution

The first issue we encountered at the beginning of the project was a team member not contributing. Alistair Bowie would often fail to attend client meetings, did not contribute during team meetings and was unable to complete allocated tasks. We approached Alistair about this issue multiple times but despite our best efforts he did not contribute to the project proposal. At this point we contacted our supervisor, Andrew Colarik, who arranged a meeting to solve this issue however this did not occur as Alistair dropped out of the paper.

2.3.2 Development platform incompatibility

Our biggest issue in this project was setting up the development platform. Our client had a demo code which we were given to work with, however it was developed using the Xcode IDE. As most of our team members did not have access to Mac we attempted to import the code into Visual Studio on our Windows computers but it was incompatible. Therefore we contacted Andrew who referred us to Ramon Lewis who allowed us to borrow Mac book Pros. The members who owned their own Mac had to install Xcode IDE. They downloaded Xcode IDE (Ver. 6) from ITunes, but we found out the demo version was incompatible. Since the demo version was created on Xcode IDE version 5.0.2, we had to down grade from the current version in order to access the add-ons, library and openFramework examples.

2.3.3 Team Leader & Supervisor

The most recent issue we encountered was Evan Martin leaving the team which left only two members. This meant the two remaining members had to take on a larger workload and responsibilities. Soon afterwards Andrew also left AUT, so we now have to meet our new appointed supervisor and get them up to date with our project.

2.3.4 Technical issue

A technical issue is that our Mac book specifications are not as good as the client's Mac desktop that is the same as the one at Aotea Centre. The project runs more smoothly on the desktop, so on our Mac books we are limited to testing out the codes to check if they process or not.

We had a video recording example from an openFrameworks. In this example the video began recording when the spacebar was pressed and when pressed again the recorded video would replay continuously. We used the code from this example as a starting point to develop this project but what we really need to do now is to code the program so that it records for set times automatically during interactions.

2.4 Project Team Recommendation

As a team, we recommended two main areas of improvement to enhance the project.

2.4.1 Communication

We would like to improve communication between team members, supervisor and client. This will increase awareness of project progress and productivity. Face to face meetings should be planned more often among team members as well as our client. This way we will better understand and gain clarification of our client's needs thus minimizing the risk of misunderstandings.

2.4.2 Programming language

Up until now, all team members used Java and this was the first time we used C++. Therefore we carried out some research prior to commencing the project. As we are not experts around C++ we need to support each other understanding to ensure no one is left behind or confused. While coding we should always check that all team members understand what is going on and why each code is being used as we go along. This will enhance the team's knowledge all together which will benefit the project and its progress.

3. Project Timeline

Semester 2 2014

Week	Tasks	Status
6	Sprint 0 • Analyze code • System analysis • User stories Research requirement for engineering	Completed
7	Setup development platform on Mac	Completed
8	Sprint 1 • Create new project using the relevant code extracted from the demo	Completed
9	• Testing and development • Client meeting with demonstration	Completed
10	Sprint 2 • Testing and development • Working with OpenNi • Callback method for new users & recognized gestures step up	Completed
11	• Testing and development • Client meeting with demonstration	Completed
12	Sprint 3 • Working on hand position coordinates • Creating a mask when user interaction	Completed
13	• Testing and development • Client meeting with demonstration	Completed

Semester 1 2015

Week	Tasks	Status
1	Sprint 4 • Video recording and playback at position of recording	Ongoing
2	• Testing and development • Client meeting with demonstration	Ongoing
3	Sprint 5 • Record and playback multiple masks at once	To complete
4	• Testing and development • Client meeting with demonstration	To complete
5	Sprint 6 • Add extra features after discussing with client	To complete
6	• Testing and development • Client meeting with demonstration	To complete
7	Sprint 7 • Find and fix errors	To complete
8	• Testing and development • Client meeting with demonstration	To complete
9	Extended sprint 7 • Set the project to run 24/7 without errors	To complete
10	• Client meeting with demonstration • Final project release	To complete

4. Quality Assurance

Quality assurance will be carried out using the following methods:

4.1 Peer review
We will review each other's code to minimize errors. We can also provide feedback to each other's work to maintain good communication and high quality of work.

4.2 Acceptance test
Up until now we think that this testing has not been carried out as frequently as it should have. Acceptance testing will be carried out on a regular basis to check that our software meets the specifications of our client.

4.3 Client meeting
We will meet with our client more often to ensure that we stay on the right track and it will also provide us with the opportunity to ask questions and also to receive feedback on our progress.

5. Individual workload

Pio Kim

Tasks	Time Spent
Platform Installation	6
Research of Requirements	23
Documentation	17
Project development	72
Client meetings	29 (holiday workshop with client)
Supervisor meetings	7
Total	154

Learning Achieved

I began researching about projects that involved the use of Microsoft Kinects, openFrameworks and looked at their code examples. This was the first time some members were introduced to openFrameworks. I also researched about gesture based user interfaces so that I had a general understanding about the underlying idea of the project prior to the first client meeting.

Once I started developing the software I looked into the demo version thoroughly and was able find out how to connect the project software to the Kinect device via coding.

Ben Liang

Tasks	Time Spent
Platform Installation	5
Research of Requirements	12.30
Documentation	40.30
Project development	63
Client meetings	29 (holiday workshop with client)
Supervisor meetings	7
Total	157

Learning Achieved

Project itself

General speaking, Digital Canvas is novel and funny. The fund comes in when different moment merges together, creating visually pleasing representation for audience to see. It requires a lot of sparking and creative ideas. At the beginning of the project, we did initial research on gesture capture, OpenGL 3D graphics, and gesture recognition and heads-up user interface, which gave us some basic ideas on what we should undertake and which platform we need to work on.

Personal Technique

I am not familiar with C++ as Java is our first programming language. I have to learn from the openFrameworks code example. And also, due to multiple developing platforms, we can't do coding together; we have to stick to the same developing environment so that we setup Windows to reconfigure the exiting code onto Visual Studio. This involved figuring out how to attach an external code as a dependency and then configuring environment settings like include paths. This wasn't enough to get it work, as there was not much support and add-ons for Windows Visual Studio. After spending so much time on this, we decided to use Mac over Windows. Teams are eligible to require Mac machine from AUT. We configured on each Mac to undertake the rest tasks.

Communication Skills

Team has raised a conflict with Alstair who did not attend the meetings and contribute any work. We addressed this with supervisor so that we carried on the sprint and re-estimated timeline to meet our target. After the unexpected changes, we can't meet weekly goal. Timeline has been delay, so we did peer work with either Pio or Evan every day.