Introduction to Multimedia G5039 – Assessed Project - Report

Multimedia Web Page Development
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Computer Science
Submission Date: 10-12-2015

Table of Contents

1. Introduction

This report details the design and development of the assessed coursework of the Introduction to Multimedia module (G5039) of the University of Sussex Computer Science degree for candidate number 132106. It will discuss the design choices, implementation techniques and development process of the site and animation, in addition to reviewing the success and efficiency of the finished product.

Unless otherwise stated in the references section, all content was created by the author.

2. Design and Development

All code for the website and animation was composed in Notepad++, and tested in Google Chrome and Mozilla Firefox. The only other software used was Adobe Photoshop (For all image manipulation), Grass Valley Edius and Propellerhead Reason (For video and audio editing, respectively, for the video introduction), and Audacity (To get certain time information for the animation).

2.1. Website

From the outset, a decision was made to follow a simple, clean design for the site. This was to aid readability and usability, in addition to simplifying the development process. After examining a number of award-winning websites[1], a neutral colour scheme and simple header-body-footer layout was settled on. This design was based on no single website in particular, but particular elements inspired by a number of different sites.
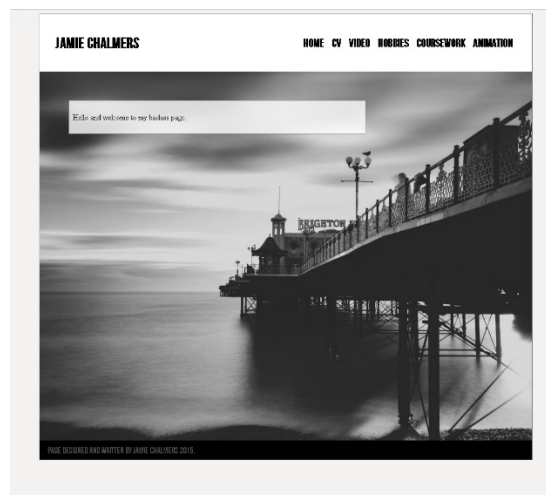
1. An early draft of the website. The final design did not change significantly from early iterations. The image above was found through Google images, and was later replaced with an original image. This was for creative reasons as much as legal or crediting reasons, as the author preferred to be responsible for all content.

The navigation bar was also something that remained unchanged after its first design. As the site had so few pages, it was not necessary to create anything more sophisticated than direct links to each individual page, clearly labelled and arranged, all accessible from the header section.

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[1] http://www.awwwards.com/websites/clean/

The style of the pages is controlled by a single external CSS stylesheet. This ensures cohesion throughout all pages. This stylesheet defines a number of divs, which are responsible for the layout of the page, and defines some specific changes such as removing text-decoration from links in the header, etc.

A later addition was the inclusion of the switchable background colours (And border colour, to improve visuals), using Javascript and buttons. This was at first simply a means to tick more boxes on the brief, however the dark background turned out to be a great complement to the existing design, and it was decided to make this the default.

Including switchable backgrounds required the use of cookies, the code for which was sourced from thesitewizard.com[2]. Cookies were the source of a major development headache, as testing was performed using Google Chrome. Chrome does not save cookies for local pages by default (It was later learned) and so many hours of incorrectly-functioning code and head-scratching were eventually down to a browser issue. In a move that was definitely not made in a rage, the primary testing browser was switched to Mozilla Firefox after this incident.

In addition to the switchable backgrounds, unique background images were made for the individual pages. This was very easy to implement using CSS. It provides a very important function, though – the pages require different sized background images to accommodate the content. Had the same image been used on every page, the main sections would either be too small to fit the content (In which case the content would pass under the footer and carry on past) or be much too big, resulting in large empty spaces. Whilst the unique images isn't necessarily a great solution from a web design perspective (As it requires the images to be resized or created from scratch specifically to fit the content), for a project of such limited page numbers as this one, it is acceptable. The unique images are nice for giving each page an individual feel, whilst the common monotone colour palette and photographical style does not compromise the consistency of the design.

All other content was fairly straightforward. The CV page did not require anything more complicated than HTML (Using tables – despite internet wisdom suggesting that even thinking about tables is an unforgivable sin, in this instance they seemed entirely suitable). The Video page was originally going to use HTML5 video features, but there were issues with audio playing but video not. It is suspected that the reason for this lay somewhere between Edius' export settings (Which are fairly complex) and the mpg to mp4 conversion the video had been through. In the end, a simpler solution was found by just uploading the mpg to Youtube.com and using the provided embed code.

The hobbies page also used some third-party code to embed a bandcamp.com player. The Tanks game was intended to be embedded using Gamemaker's HTML5 export features, but a licence for this particular export module proved to be prohibitively expensive, so the standalone .exe was included as a download instead.

2.2. Animation

The design for the animation was something that evolved very naturally out of learning and experimentation with Javascript and the Raphael library. The only initial idea was the beginning 'creeping' lines running from the corners to the centre in synch with the music. From here, all other

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[2] http://www.thesitewizard.com/javascripts/cookies.shtml

ideas grew out of trying different things with Raphael, prompted by the brief, and seeing what happened. For instance, the floating skull was first included so as to check the 'Contains imported bitmap images' part of the brief. After including it, it actually provided a great focal point for the whole animation and contributed massively to the tone of the final piece. It seemed so strange and surreal that it inspired the "Let's be friends" text at the end, and thus created a reason to try text functions, etc.

The actual control of the animation was performed using a number of functions. Each separate element of the animation (The psychedelic shapes, the skull, the text etc) was written inside a javascript function. These were then all called in a larger run_animation() function. This could be triggered by clickable buttons in the 'playscreen', which appeared when the animation first ran, or the 'endscreen', which appeared at the end (Giving the viewer a chance to repeat the animation). By separating all individual elements into their own functions, it was easy to have the 'Play Again' button, for example, delete all existing elements, but then recreate certain parts (Such as the background), without having to repeat any code. This tidy approach, with all behaviours contained in functions, meant fine-tuning the code (For instance, tweaking the order in which certain functions were called) was very easy.

Synchronisation between the video and audio was also simple to implement. As much as possible, defining anything in literal terms (As milliseconds) was avoided. Instead, the BPM of the audio track was worked out by using a tap-tempo tool. Some manipulations were then performed on this number to work out the length of a beat, and save it to a variable. Once this was worked out, it was very simple to give animation lengths in terms of this variable – eg, (beat * 16) for an animation function lasting 16 beats. After manually setting a delay at the beginning to allow for the brief pause before the audio starts, very nice synchronisation was achieved.

The timing of all animation was performed using Raphael's element.animate(delay) function, which tells an animation to run only after a specific delay. Later in development, the javascript function "setTimeout()" was discovered, and used to run a few functions that did not have animations. The option of rewriting all the element.animate(delay) functions to use setTimeout() instead was considered (For the purposes of tidiness and cohesion throughout the code), but was deemed unnecessary.

The "psychedelic shapes" (As they are referred to in the code) were interesting. They are paths which grow from single points in the centre to triangles running from the centre to the edges. By the time the animation was finished, it became obvious that this was unnecessary – the way they move means all 4 of them could have simply been one rectangle, and it would have provided the same effect. However, as the existing code did not create any errors, it was left as it was. This left the option open to adjust the individual shapes later.

The psychedelic shapes also gave an opportunity to use for loops and arrays to create all 32 individual instances, with different colours and timings, without a huge amount of code. This was the only example of these programming techniques throughout the project, and it was rewarding to use Javascript in this way.

```
1.  var psychedelic_shapes_colors = ["#ff0000","#0000ff","#00ff00","#ff00ff"];
2.  var colorPicker = 0;
3.
4.  for (i = 0; i < 32; i++) {
5.      if (colorPicker > 3) {
6.      colorPicker = 0;
7.      }
8.      psychedelic_shapes(psychedelic_shapes_colors[colorPicker], (psychedelicShapesDel
    ay + (beat * i)));
9.      colorPicker++;
10. }
```

2. The code used to generate the 'psychedelic shapes'

3. Conclusion

The project was a success and meets all core requirements, in addition to a number of optional extras. In particular, the aesthetic design of the site was very pleasing, and the artistic content of the animation was unexpectedly interesting. It was very rewarding to explore the potential of technology and scripting to express artistic ideas that would not be achievable through non-digital mediums. This was inspiring and the freedom of creativity stimulated the will to work – this resulted in a very painless development process, which was an important lesson to take away from the project.

Despite the straightforward development and generally good end product, there are a number of areas that could have been improved. The site was developed for one browser, and whilst a short check of the pages in all major browsers does not reveal any obvious issues, there was no deep investigation into any misbehaviour or bugs in other browsers aside from Firefox (The Chrome cookies issue notwithstanding – this would not be a problem when viewing the page online). Furthermore, the site has no optimisation for mobile viewing, or viewing in a window smaller than at least 600px wide. There is no hideous warping of elements when the page is made smaller, but it would only be a good thing to have some response and re-arrangement for this.

It should be acknowledged that there were a few other minor issues (Most of which have been mentioned in previous sections – such as the use of a Youtube video) that do not currently affect the functionality of the site, but could have been implemented in a more sound manner (In the example of the Youtube site, not relying on a third-party server would be better).

4. References and Sources

"Skull" image in animation: Originally sourced from http://lookfordiagnosis.com/mesh_info.php?term=skull&lang=1, with additional manipulation performed in Adobe Photoshop.

"Bebas Neue" font and script: https://edgewebfonts.adobe.com/

Cookies script : http://www.thesitewizard.com/javascripts/cookies.shtml

PDF Icon: http://www.imeimage.com/download-pdf-icon

Bandcamp player: http://bandcamp.com

Youtube player: http://www.youtube.com