Considering Visual Aesthetics as a Part of the HCI Curriculum

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"What is beautiful is usable" Tractinsky, et al. [30]

Abstract

The importance of the user interface's aesthetics to the user experience has been acknowledged for some time. Yet visual aesthetics is rarely covered in HCI courses. We have integrated material on aesthetics into our 3rd year HCI course. In this paper we put forward the argument for including visual aesthetics; describe how we have integrated aesthetics into our course; reflect on the first offering of this new module and describe changes underway for the next offering of the course.

Introduction

The design of graphical user interfaces (GUI) of the computer system has been a core component of HCI courses. Traditionally the focus has been on the usability of the design, emphasising "utility and operational ease of use"[17] . This emphasis on utility is not surprising when one reflects on the hardware that was available in the early years of HCI. However GUIs have evolved from grainy black-and-white and text-only to high definition, 1000+ colours with support for high definition graphics.

In parallel to the evolution of hardware, computer systems have become ubiquitous. And along with this the perceived visual aesthetics of a graphical user interface (GUI) has become more important. Aesthetics affect all aspects of the interaction [1] Numerous studies have shown that aesthetics has a bearing on usability [4] [13] [9] [11] [12] . There is a relationship between trust and aesthetics [2][15] and users have a higher tolerance for errors with aesthetically pleasing systems [7] . Thus we argue that the aesthetics of an interface design can no longer be ignored in the HCI curriculum.

Fortunately people can immediately judge whether something is aesthetically pleasing [3] [15] and there is a reasonable level of agreement between people as to whether something is or is not pleasing. However, if asked why, the untrained person is likely to struggle to elucidate what it is that makes something pleasing or not. More difficult again is to, by design, create an artefact that is aesthetically pleasing. Graphic designers are the experts at this, and we cannot hope to rival their knowledge and skill in the scope of a Computer Science HCI course. However we have redesigned a module of our course so that aesthetics is considered.

We teach a traditional Computer Science HCI course in a 3 year Computer Science degree. Computer Science sits in a large, diverse science faculty within New Zealand's largest

university. The majority of the students in our course have entered university directly from high school. Most are Computer Science majors, and about half are double majors or are doing double degrees. Popular other majors/ degrees are information systems, maths, physics,. But many other combinations are possible including law, business degrees, arts. Unfortunately, although the university has a fine arts department, joint science/fine arts study is almost impossible. The HCI course is delivered over twelve weeks with three one hour lectures per week and one, one hour lab-based tutorial per week (48 hours in total). Students are expected to spend another 140 hours in self-study. The course is offered once a year and over 200 students take the course each offering.

Aesthetics Module

In 2011 we redesigned the module 'design details' to include aesthetics. We assumed, and found it to be true, that students could judge the attractiveness of a GUI. The learning outcomes for the module were that students could:

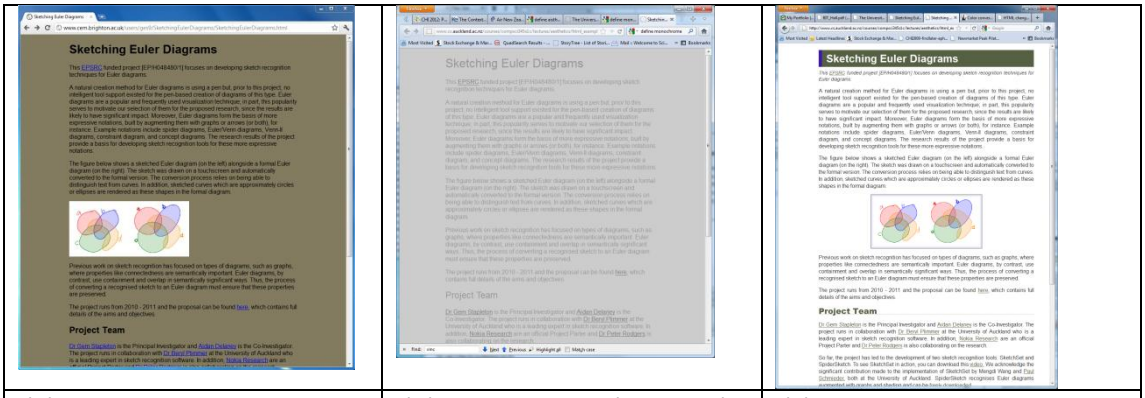
- Describe what elements were adding or detracting from the attractiveness of a particular GUI
- Improve a GUI by modifying elements
- Imitate the aesthetics of an attractive GUI

Previously the design details module consisted of four lectures covering colour, fonts, icons and forms. These lectures took a traditional Computer Science approach. In a different section of the course there was a lecture on layout. The source material was mainly drawn from the textbooks we have used including [6] and [8] . While we covered the human perceptual system, technical aspects, and a range of other issues aesthetics was not considered.

The 2011 course replaced the design details module with a module we labelled 'visual aesthetics'. While the modern meaning of 'aesthetics' is beauty, the Greeks considered function as well as form to be a part of the notion of 'aisthanesthai'. Indeed in the context of GUIs it is difficult to untangle form and function so we incorporated both in our module. The first lecture was an introduction and covered text, this was followed by lectures on colour and images, lines and borders, forms and controls and a lab where the students experimented with visual elements.

In the first lecture we sensitised the students to aesthetics by looking at good and bad examples and discussed the importance of aesthetics. We then covered the three principles of aesthetics: balance, emphasis and unity[5] . In the context of GUIs these design principles are achieved by altering the GUI components: font, colours & images, lines & borders & controls. These exist as both background and foreground elements. In a design course students would revisit these ideas time and again and iterate through exploration of the principles, elements and interactions between them as they develop their design skills[10] .

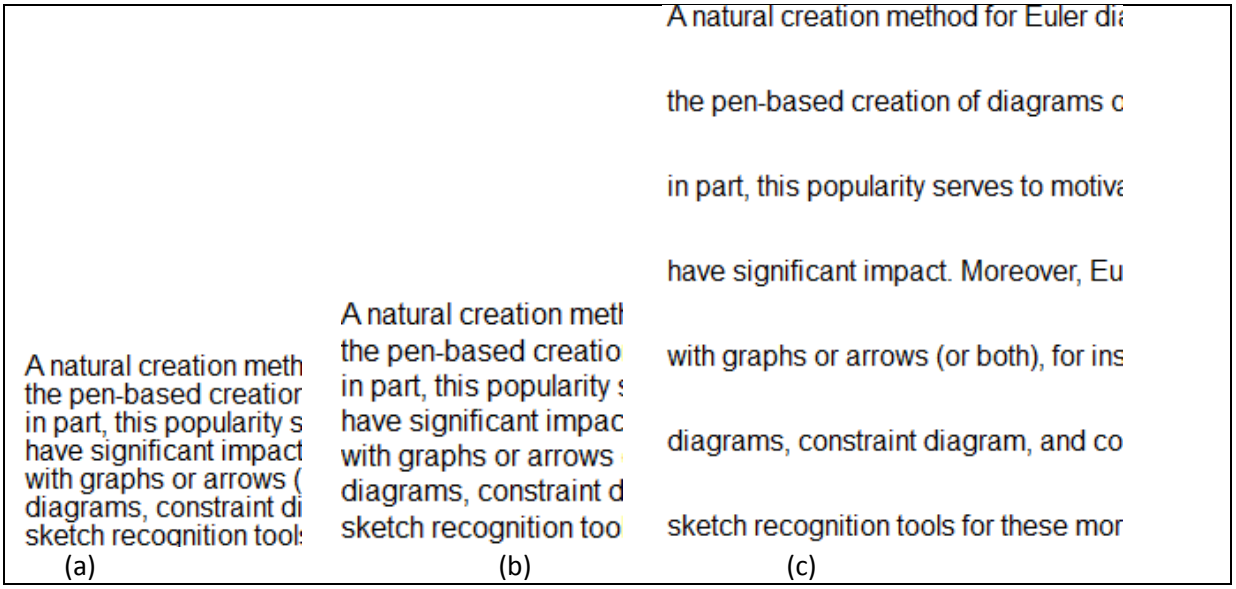
It is not the purpose of an HCI course to teach design and we do not have the time for in-depth and iterative exploration. We took a more structured approach and considered each of the elements of design independently. As the students are already familiar with HTML we use it to operationalize the process. Through the remainder of the module a simple static web page (Figure 1) was used as the experimental object.



(a) Original page | (b) Low contrast (high key) | (c) Aesthetically pleasing

Figure 1. Three versions of the exemplar web page[1]

This same lecture covered text/fonts. It incorporated an overview of the purposes of text and reading; the basics of typography and Text as a design element – for example fancy fonts for headings. We created various renderings of the exemplar web page to demonstrate the different principles, portions of the examples to demonstrate interline gap are shown in Figure 2, other examples are available on the course web page [1]



(a) (b) (c)

Figure 2. Text line leading example – (a) no interline gap, (b) about right (c) too much

The second lecture included colour and images – images are difficult to compartmentalize as they vary considerably and affect all aspects of the aesthetics. However, they often have a major effect on colour hence our inclusion in this lecture. This lecture started with an overview of colour theory and discussion and examples of the importance of value, hue and contrast to the readability and aesthetics of a GUI. In this section the examples were mostly monochrome to emphasise the basics (just as design students often start with monochromatic design). This was followed by the basics of colour schemes and the relationships between colour and branding. Finally we considered how images contributed to the colour scheme.

[1] Our thanks to Gem Stapleton, for allowing us to use this webpage.

We generated various versions of our sample web pages to demonstrate the principles and drew on real web examples for the discussions on colour schemes and branding. Creating a sophisticated and appealing colour scheme is an expert task and we did not attempt to teach this, we did however point out various resources where 'ready-made' colour schemes are available.

The third lecture of the module was on lines and borders. We discussed how lines and borders group and segment a display. We also looked at corner treatments and their effect on the feel of a page. This lecture should have been more closely linked to the earlier lecture on layout because they are closely related – the placement, or not, of a border around a group of items often affects whether they are perceived as a group. At this point we went back to the original examples shown in the first lecture and as a class activity spent some time analysing both the good and the bad examples.

It was quickly evident that the students now had the skills to analyse the examples. For the good pages they made comments like 'xxx has a really effective use of a monochrome colour scheme' , 'the contrasting fonts on this page are good except they have broken the flow with the font used for xxx'. For the poor pages they could say, 'the problem with this page is xxxx'. We also showed them various nice renderings of our exemplar web page.

There was one lab session dedicated to this module. We made the source and .html and .css files of our exemplar page available to them. Their task was to find a webpage that they thought had pleasing aesthetics and to imitate those aesthetics on the exemplar page. The students were delighted with the results they achieved! In the final examination we asked them to analyse the aesthetic elements of a page – we were pleased with the competence they demonstrated.

Reflections

Last year was the first time we incorporated aesthetics into the HCI course. We surveyed the students to get their thoughts on the new module. They were in general happy with the module and believed that they had learnt valuable skills and knowledge. A few said that they had covered it all before in art classes at school, while others said it was something they had never thought about before. With a large, diverse student body such diversity of pre-existing knowledge is inevitable. We think we pitched the content at about the right level.

The new module replaced our traditional teaching of colour etc. Much of the original material on the principles of the various elements is included in the new module. However the emphasis has shifted to include not only the functional effect of, for example, contrast, but also the aesthetic effect.

We did not get quite the right lectures in the module. It should have included the lecture on layout and the lecture on form controls should be left out. These amendments will be made for this year.

We created a large number of different versions of our exemplar web page. While these were effective to demonstrate the various elements they got a bit unwieldy. We are considering a website that brings all the exemplars together or perhaps an app where one can interactively change the settings.

Visual aesthetics is only one aspect of interaction aesthetics. Other forms of interaction such as audio and tactile also have aesthetic elements. We noted this in our discussion on those interaction methods – those that are interested can investigate independently or as a project in the graduate HCI course.

Conclusions

The aesthetics of a user interface is important. It is known to affect the usability and trust of the interface: therefore aesthetics should be included in basic HCI courses. We have done this by refashioning that part of the course that has most influence on aesthetics to consider GUI design elements in the light of their aesthetic and functional effects. The student work produced in the lab session and examination provided evidence that they had met the learning outcomes. We are planning some refinements to the aesthetics module for this year, but overall we were satisfied with this first offering of the module.

References

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http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/
intro
http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/aesthetics/01_intro.ppt
text
http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/aesthetics/02_text.ppt
colour and images
http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/aesthetics/03_colour.ppt
lines and borders
http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/aesthetics/04_lines_borders.ppt
lab tutorial
http://www.cs.auckland.ac.nz/courses/compsci345s1c/tutorials/aesthetics%20tutorial.pptx
(note that this the live course web page – 2011 material will soon be placed into the archive and replaced with 2012 material

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Answers to questions

We think we have covered most of this above, so brief responses.

What I tried successfully

We have incorporated aesthetics into our HCI course.

Changes that I made

No changes so far, as it has only been offered once. However as indicated above we will move the layout lecture into this module this year and the form design lecture out.

Readings I found interesting

References above, in particular [5] Carter, R. 2003. Teaching Visual Design Principles for Computer Science Students.

There are also various resources linked from the lectures. http://www.cs.auckland.ac.nz/courses/compsci345s1c/lectures/ (note that this the live course web page – 2011 material will soon be placed into the archive and replaced with 2012 material. http://www.csszengarden.com/ is a particularly useful rich resource.

Tips and strategies I found useful

Key the students in to the importance of aesthetics in the first lecture of the module.

What I found challenging

Covering the volume of material in just a few lectures – it's the old depth versus breadth problem.

What did not work for me

Our exemplars resources got to be rather messy

What would have helped me

A nice app or website that demonstrated the different effects