INF3720 LESSONS

Lesson 1

Chapter 1: What is Interaction Design?

Overview

This study unit begins by examining what the discipline of interaction design is. It starts off by looking at the differences between a good and a poor design, highlighting how products can differ radically in their usability. It then describes what and who is involved in interaction design. In the last part, the chapter outlines core principles of design, as well as usability and user experience goals, and how these are used to assess interactive products. An assignment is presented at the end of the chapter in which you have the opportunity to put into practice what you have read, by evaluating an interactive product using various usability criteria. It therefore sets the scene for the module.

Objectives

The main aims of this chapter are to:

- Explain the difference between good and poor interaction design.
- Describe what interaction design is and how it relates to human-computer interaction and other fields.
- Explain the relationship between the user experience and usability.
- Explain the concepts of accessibility and inclusiveness in relation to HCI.
- Describe what and who is involved in the process of interaction design.
- Outline the different forms of guidance used in interaction design.
- Enable you to evaluate an interactive product and explain what is good and bad about it in terms of the goals and core principles of interaction design.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 1 - What is Interaction Design?

Slides

http://www.id-book.com/slides-5ed.html

Chapter 1 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 1.4. The assignment should enable you to begin talking about the usability of interactive products in terms of a variety of parameters. Instead of simply saying "nice cell phone, lovely to use", or "awful MP3 player, really bad design", you

should now be equipped (having studied chapter 1 and associated readings) with a set of terms and concepts that can help you describe what is good and bad about an interactive product's design in terms of usability.

Additional notes:

Background

A diversity of user experience goals has been articulated in interaction design, which cover a range of emotions and felt experiences. These include desirable and undesirable ones as shown in Chapter 1. Many of these are subjective qualities and are concerned with how a system feels to a user. They differ from the more objective usability goals in that they are concerned with how users experience an interactive product from their perspective, rather than assessing how useful or productive a system is from its own perspective. Whereas the terms used to describe usability goals comprise a small distinct set, many more terms are used to describe the multifaceted nature of the user experience. They also overlap with what they are referring to. In so doing, they offer subtly different options for expressing the way an experience varies for the same activity over time, technology, and place. For example, we may describe listening to music in the shower as highly pleasurable, but consider it more apt to describe listening to music in the car as enjoyable. Similarly, listening to music on a highend powerful music system may invoke exciting and emotionally fulfilling feelings, while listening to it on an iPod Shuffle may be serendipitously enjoyable, especially not knowing what tune is next. The process of selecting terms that best convey a user's feelings, state of being, emotions, sensations, and so forth, when using or interacting with a product at a given time and place can help designers understand the multifaceted and changing nature of the user experience.

Usability goals: concerned with meeting a usability criteria (e.g. efficiency)

- Effectiveness - how good system is at doing what it is supposed to
- Efficiency - the way a system supports users in carrying out their tasks
- Safety - protecting the users from dangerous conditions / undesirable situations
- Utility - extent to which the system provides the right kind of functionality so that users can do what they need or want to do
- Learnability - how easy a system is to learn to use
- Memorability - how easy a system is to remember how to use, once learned

Desirable aspects

- Satisfying
- Enjoyable
- Engaging
- Pleasurable
- Exciting
- Entertaining

- Helpful
- Motivating
- Challenging
- Enhancing sociability
- Supporting creativity
- Cognitively stimulating
- Fun
- Provocative
- Surprising
- Rewarding
- Emotionally fulfilling

Undesirable aspects

- Boring
- Frustrating
- Making one feel guilty
- Annoying
- Childish
- Unpleasant
- Patronizing
- Making one feel stupid
- Cutesy
- Gimmicky

Lesson 2

Chapter 2: The Process of Interaction Design

Overview

Design is a practical and creative activity, the ultimate intent of which is to develop a product that helps its users achieve their goals. This unit and the next three will explore how we can design and build interactive products.

Developing a product must begin with gaining some understanding of what is required of it; but where do these requirements come from? In this unit we raise and answer these kinds of questions and discuss the four basic activities and key characteristics of the interaction design process. We also introduce a life cycle model of interaction design that captures these activities and characteristics.

Objectives

The main aims of this chapter are to:

- Reflect on what interaction design involves.

- Explain some advantages of involving users in development.
- Explain the main principles of a user-centred approach.
- Introduce the four basic activities of interaction design and how they are related in a simple lifecycle model.
- Ask some important questions about the interaction design process and provide the answers.
- Consider how interaction design activities can be integrated into the wider product development lifecycles.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 2 - The Process of Interaction Design

Slides

http://www.id-book.com/slides-5ed.html

Chapter 2 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 2.5 - you can, for example, use an online shopping site like *bidorbuy* or *Takealot*. The main purpose of this activity is for you to apply usability criteria and user experience goals to determine the quality of the site or its underlying conceptual model. Make sure that you apply the principles to the site of your choice (be specific).

Lesson 3

Chapter 3: Conceptualizing Interaction

Overview

Imagine that you have been asked to design an application to let people organise, store and retrieve their e-mails in a fast, efficient and enjoyable way:

- What would you do?
- How would you start?
- Would you begin by sketching out how the interface might look, work out how the system architecture will be structured, or even just start coding?

- Alternatively, would you start by asking users about their current experiences of saving e-mails, look at existing e-mail tools and, based on this, begin thinking about why, what and how you were going to design the application?

Interaction designers would begin by doing the latter. It is important to realise that having a clear understanding of what, why, and how you are going to design something, before writing any code, can save you enormous amounts of time and effort later on in the design process. Ideas not contemplated thoroughly, and incompatible and unusable designs should be ironed out while it is relatively easy and painless to do so. Once ideas are implemented (programmed), which typically takes considerable effort, time, and money, they become much harder and much more painful, to throw away. Such preliminary conceptualising of ideas about user needs and what kinds of designs might be appropriate is, however, a skill that needs to be learned (user needs in this context refer to the range of possible requirements, including the users' wishes, needs and experiences). It is not something that can be done overnight through following a checklist, but requires practice in learning to identify, understand and examine the issues – just like learning to write an essay or to program. In this study unit we discuss what is involved, and in particular, focus on what it takes to understand and conceptualise the interaction.

Objectives

The main aims of this chapter are to:

- Explain how to conceptualize interaction.
- Describe what a conceptual model is and how to begin to formulate one.
- Discuss the use of interface metaphors as part of a conceptual model.
- Outline the core interaction types for informing the development of a conceptual model.
- Introduce paradigms, visions, theories, models, and frameworks informing interaction design.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 3 - Conceptualizing Interaction

Slides

http://www.id-book.com/slides-5ed.html

Chapter 3 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 3.2 - you can, for example, use the *bidorbuy* site or the *Takealot* site. The main purpose of this activity is for you to understand how seemingly similar tasks can have quite different conceptual models underlying their design, and that these

can greatly affect the way they are used. Having different underlying conceptual models for the task provides different ways of achieving the core activities of "planning ahead and reminding".

Lesson 4

Chapter 5: Social Interaction

Overview

People are inherently social. Various digital technologies enable us to maintain social interaction over a distance. This chapter focuses on face-to-face and remote social and professional interaction in order to provide guidelines for the successful design of social technologies.

Imagine not having access to your smartphone or the Internet for a week. How would you cope? Would you get bored, start twitching, or even go stir crazy? Would you feel isolated and be constantly wondering what is happening in your online social network? Many people now cannot go for very long without checking for messages, the latest tweets, Facebook updates, emails, etc. – even when on vacation. For many, checking their phone is the first thing they do when waking up. It has become a daily routine and an integral part of their social lives. This is not surprising given that humans are inherently social: they live together, work together, learn together, play together, interact and talk with each other, and socialize.

There are many kinds of sociality and many ways of studying it. This chapter focuses on how people communicate and collaborate in their social, work, and everyday lives. It examines how the emergence of a diversity of communication technologies has changed the way people live - the way they keep in touch, make friends, and coordinate their social and work networks. We look at the conversation mechanisms that have conventionally been used in face-to-face interactions and examine how these have changed for the various kinds of computer-based conversations that take place at a distance. We describe the idea of telepresence, where novel technologies have been designed to allow a person to feel as if they are present or to give the appearance of being present at another location. We also outline some technologies that have been developed to enable new forms of interaction, focusing on how shareable technologies can facilitate and support collocated collaboration.

Objectives

The main aims of this chapter are to:

- Explain what is meant by social interaction.
- Describe the social mechanisms that people use to communicate and collaborate.
- Explain what social media means.

- Give an overview of new technologies intended to facilitate collaboration and group participation.
- Discuss how social media have changed how we keep in touch, make contacts and manage our social and working lives.
- Outline examples of new social media that are a result of being able to connect online.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 5

Slides

http://www.id-book.com/slides-5ed.html

Chapter 5 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 5.2 in the textbook (p. 139).

Lesson 5

Chapter 6: Emotional Interaction

Overview

Designing technology that recognise people emotions automatically is called emotional AI or affective computing. Emotional design is the design of technology that can evoke desired emotional states. The chapter deals with emotional interaction which includes both affective computing and emotional design. It explains what people's emotions are and how persuasive technologies can change their behaviour, how technology can detect their emotions, and how anthropomorphism has been used in interaction design.

We look at how and why the design of computer systems causes certain kinds of emotional responses in users. We begin by looking in general at expressive interfaces, examining the role of an interface's appearance to users and how it affects usability. We then examine how computer systems elicit negative responses, for example, user frustration. Following this, we present a debate on the controversial topic of anthropomorphism and its implications for designing applications to have human-like qualities. Finally, we examine the range of virtual characters designed to motivate people to learn, buy, listen, and so forth and consider how useful and appropriate these virtual characters are.

Objectives

The main aims of this chapter are to:

- Explain how our emotions relate to behaviour and user experience.

- Provide examples of interfaces that are both pleasurable and usable.
- Explain what are expressive and annoying interfaces and the effects they can have on people.
- Introduce the area of automatic emotion recognition and emotional technologies.
- Describe how technologies can be designed to change people's behaviour.
- Provide an overview on how anthropomorphism has been applied in interaction design.

Slides: http://www.id-book.com/slides-5ed.html

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 6

Slides

http://www.id-book.com/slides-5ed.html

Chapter 6 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 6.3. You can use examples from your desktop, laptop computer or any mobile device. Also revisit the activity from the previous chapter and try to identify online agents used at the website that you investigated. The genre of fronting online shopping sites with virtual sales agents seems to be on the wane at the moment (perhaps an after-effect of the dot.com crash). Miss Boo (http://www.boo.com) can still be seen helping out, although she does not feature nearly as much nor interact with the user as she used to. You can still get an impression of the style of interaction she was designed to exemplify. Also, you could look at another kind of virtual agent like the Agentry site (http://www.agentry.net/) or watch Ananova (http://www.ananova.com) and ask the same questions in terms of the kind of a website that this agent has been designed for (e.g. a news site).

Lesson 6

Chapter 8: Data Gathering

Overview

This chapter presents some techniques for data gathering which are commonly used in interaction design activities. In particular, data gathering is a central part of identifying needs and establishing requirements, and of evaluation.

Within the requirements activity, the purpose of data gathering is to collect sufficient, accurate, and relevant data so that a set of stable requirements can be produced. Within evaluation, data gathering is needed in order to capture users' reactions and performance with a system or prototype.

In this chapter we introduce three main techniques for gathering data. (Some additional techniques relevant only to evaluation are discussed in Chapters 13, 15 and 16.) These three techniques are interviews, questionnaires, and observation. Interviews involve an interviewer asking one or more interviewees a set of questions which may be highly structured or unstructured; interviews are usually synchronous

and are often face-to-face, but they don't have to be. Questionnaires are a series of questions designed to be answered asynchronously, i.e. without the presence of the investigator; these may be on paper or online. Observation maybe direct or indirect. Direct observation involves spending time with individuals observing activity as it happens. Indirect observation involves making a record of the user's activity as it happens to be studied at a later date. All three techniques may be used to collect qualitative or quantitative data.

Although this is a small set of basic techniques, they are flexible and can be combined and extended in many ways. Indeed it is important not to focus on just one data gathering technique but to use them flexibly and in combination so as to avoid biases which are inherent in any one approach.

The way in which each technique is used varies depending on the interaction design activity being undertaken. More detailed descriptions of how the different techniques are used within specific activities of the lifecycle are given in later chapters (Chapter 10 for requirements, and Chapters 14, 15 and 16 for evaluation). Here we give some basic practical information about each technique.

Objectives

The main aims of this chapter are to:
- Discuss how to plan and run a successful data gathering program.
- Enable you to plan and run an interview.
- Empower you to design a simple questionnaire.
- Enable you to plan and carry out an observation.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 8.

Slides

http://www.id-book.com/slides-5ed.html

Chapter 8 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 8.2 (p. 274-5).

Lesson 7

Chapter 11: Discovering Requirements

Overview

In this unit we latch on to our discussion of establishing requirements as discussed in INF1520, by providing a detailed overview of identifying needs and establishing requirements. We introduce different kinds of requirements and explain some useful techniques.

Objectives

The main aims of this chapter are to:
- Describe different kinds of requirements.
- Enable you to identify different kinds of requirements from a simple description.
- Explain additional data gathering techniques and how they may be used to discover requirements.
- Enable you to develop a persona and a scenario from a simple description.
- Describe use cases a way to capture interaction in detail.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 11.

Slides

http://www.id-book.com/slides-5ed.html

Chapter 11 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 11.1 - you can also use your online management system or online library facility as the example.

Lesson 8

Chapter 14: Introducing Evaluation

Overview

Evaluation and design are very closely integrated in user-centred design. The aim of this unit is to introduce basic evaluation concepts that will be revisited and built upon in the units 8-10 (chapters 14-16). It also shows how different techniques are needed for different purposes and how techniques are used together to gain different perspectives on a product's usability.

Objectives

The main aims of this chapter are to:
- Explain the key concepts and terms used in evaluation.
- Introduce a range of different types of evaluation methods.
- Show how different evaluation methods are used for different purposes at different stages of the design process and in different contexts of use.
- Show how evaluation methods are mixed and modified to meet the demands of evaluating novel systems.
- Discuss some of the practical challenges of doing evaluation.

- Illustrate through short case studies how methods discussed in more depth in Chapters 8-10 are used in evaluation and describe some methods that are specific to evaluation.
- Provide an overview of methods that are discussed in detail in the next two chapters.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 14.

Slides

http://www.id-book.com/slides-5ed.html

Chapter 14 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 14.1 (p. 497)

Lesson 9

Chapter 15: Evaluation Studies: From Controlled to Natural Settings

Overview

This unit describes user testing, which is at the core of usability testing. The various aspects of user testing are discussed, including setting up tests, collecting data, controlling conditions and analysing findings. Experimental design and how experiments differ from user testing and field studies are also discussed.

Objectives

The main aims of this chapter are to:
- Explain how to do usability testing.
- Outline the basics of experimental design.
- Describe how to do field studies.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 15.

Slides

http://www.id-book.com/slides-5ed.html

Chapter 15 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 15.3, p. 541.

Lesson 10

Chapter 16: Evaluation: Inspections, Analytics, and Models

Overview

The evaluation methods described so far in this book have involved interaction with, or direct observation of, users. In this chapter we introduce methods that are based on understanding users through knowledge codified in heuristics, or data collected remotely, or models that predict users' performance. None of these methods require users to be present during the evaluation. Inspection methods typically involve an expert role-playing the users for whom the product is designed, analysing aspects of an interface, and identifying any potential usability problems by using a set of guidelines.

The most well-known are heuristic evaluation and walkthroughs. Analytics involves user interaction logging, which is often done remotely. Nielsen's set of heuristics (revised) is an essential set of usability principles that are used to evaluate or guide digital systems' design. Predictive models involve analysing the various physical and mental operations that are needed to perform particular tasks at the interface and operationalizing them as quantitative measures. One of the most commonly used predictive models is Fitts' Law.

Objectives

The main aims of this chapter are to:

- Describe the key concepts associated with inspection methods.
- Explain how to do heuristic evaluation and walkthroughs.
- Explain the role of analytics in evaluation.
- Desribe how A/B testing is used in evaluation.
- Describe how to use Fitts’ Law – a predictive model.

Study Material

Preece, Rogers and Sharp, Interaction Design, 5th ed.: Chapter 16.

Slides

http://www.id-book.com/slides-5ed.html

Chapter 16 Web Resources

http://www.id-book.com/index.php

Activity

Do activity 16.1. You may use the myUnisa website as the website that you want to evaluate. You may also use Nielsen's set of heuristics to do the evaluation.