**6CS003 Emerging Technologies Assessment 3**

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**Review:**

The first lecture covered Computer Game Interaction which is the sensor technology for example a gamepad, used in the games industry to perform a particular action such as moving a character or changing the camera angle in a computer game.

The lecture covers computer game concepts such as virtual worlds, game engines and a general background on computer games, the lecture shows the evolution of computer games and the hardware used especially input devices, essentially giving a history of computer games and the sensor technologies used. Next the lecture details existing and emerging sensor technologies including a background on the technology, several existing technologies and concepts being developed including motion sensors, natural user interfaces (NUI), ambient intelligence and pervasive games.

The second lecture covered a project which was designed to provide a way for customers to clearly see where their food comes from. The project would have all products serialized using radio frequency identification (RFID) and receive its own website that would detail the origin of the food, the suppliers involved with the product, dates and times etc.

The lecture covers the technical details of the project including how it conforms to electronic product code (EPC) global specs for the serialization of products, next it details the sensors service the project is to provide, a trace service, and examples of how RFID is used to achieve the projects aims, also the projects method for system development. The lecture also shows some prototypes used as examples of how the technology could look, as well as the benefits this project could bring to industry.

The first lecture was very informative on the topics it covered on the concept of Computer Game Interaction, it allows for understanding for those unfamiliar with the topic and with its use of links to further reading and video examples of sensor technologies the lecture allowed for further understanding of the topics it covered. Therefore this lecture would be very useful to someone studying this topic, it could be improved by adding practical components for clarity on some of the points it covers.

The second lecture did not lack for detail in terms of the different aspects of the project, such as the project details, services the project would provide, RFID examples, system development etc. The lecture gave examples where appropriate in order to give a clearer view of the general direction of the project however the lecture would have benefited from including a practical example of its prototypes or video clips as this would help to support the lectures portrayal of this project, therefore the lecture would be useful to someone researching or writing a report on this project.

**Computer Game Interaction**

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The recent developments in Computer Game Interaction have shown how it has more uses than simply in the games industry but for society as well, in this paper I give an introduction to Computer Game Interaction, I show the uses and repercussions, limitations and similar technologies.

1. **Introduction**

# Computer Game Interaction is the sensor technologies used in computer games to perform actions such as moving a character or changing the camera angle which are then represented on a screen for a user to see. There are a great many sensor technologies that have been developed over the years to enhance the users experience while playing computer games. The first sensor technologies used for computer games emerged from the need for an interface between the hardware and the user, therefore input devices such as buttons and knobs or joysticks, paddles, mouse and keyboard etc, were created by early game developers on consoles such as Magnavox Odyssey 2 in 1978, Pong in 1972, the Apple II in 1977 as well as many others. During these early days of the games industry many of the companies developing these games were designing and producing their own input devices with varied results.

However these input devices could be improved upon and during its history sensor technologies has been developed much over time to give users a much greater experience when playing computer games. Examples of these developments are gamepads, steering wheels with pedals, touch screens etc as well as keyboard and mouse which are still in common use today. More recently developments in sensor technology has led to the success of motion control of which there was little beforehand, this technology has been implemented in several consoles such as the Playstation 3 with its Playstation move, the Wii with its remote and joystick as well as the Xbox 360 with the Kinect which is a combination of technologies such as a camera, microphone and depth sensor leading to the user being able to use their whole body as a controller and with a natural user interface that helps the user greatly with actions to perform or simply how they play the game it is clear sensor technologies have developed much for the users benefit, this is in part supported by the work of Jorgensen, K. (2012), which describes user interfaces and how they affect a user.

These advances in sensor technology are important and have led to the user feeling much more a part of the game than before, however there continue to be developments in this area and future input technologies and advancements are on the way, such as Artificial intelligence, increased interconnectivity for example by having computers embedded into everyday object such as clothing which is already coming into the market in one form or another, it is clear these developments will lead to others that will build upon the sensor technologies of today.

1. **Applications and Implications**

The sensor technologies used in computer games allow the user for greater interaction and experience when playing a computer game, however these technologies have other applications outside this are such as the full body motion control available from Kinect an input device for the Xbox 360 console, full body motion control as a sensor technology can also be used to help older adults in care homes to be able to keep fit and active, if games are designed with elderly persons requirements such as a game that takes in mind their impairments due to increased age this would be a great asset to the care homes looking after the elderly. This technology would be beneficial as it would have a positive effect on mood and therefore the emotional well being of the elderly. It would also by keeping the elderly active and providing exercise, improve their quality of life as well as their life expectancy; this is supported by the work of Gerling, K. M, (2012). Therefore by introducing the full body motion control sensor technology into care homes for the elderly, they will benefit from increased activity, exercise and improved emotional well-being.

Another application of computer game sensor technology would be pervasive gaming, which is the use of several technologies such as the Global Positioning System (GPS), Global System for Mobile Communications (GSM) or wireless local area networks(WLAN) etc to triangulate a players position all of which can be accessed with modern smart phones to play these games that are designed to be played outdoors. These games vary but most strive to have the user accomplish a task by visiting a location, perhaps in a race with other users for example, this would enable the user to exercise and have a positive experience with the game at the same time thereby improving the users health and be able to play a game in an open environment with the possibility of many other users as well allows for great interactivity, this is supported by the work of Jegers, K. and Wilberg, M. (2006).

One application of computer game sensor technology would be to play a game that was aware of your emotional state and from that be able to tailor it to best take into consideration a players emotions. This bio-affective gaming interface (BAGI) would determine a users emotions by the use of neural networks trained to recognise physiological patterns of emotions, this would improve a game systems awareness and therefore interactivity similar to an Artificial Intelligence (AI), the implementation of this technology when developed further would improve the emotional experience of users for a greater gaming experience, this is supported by the work of Arroyo-Palacios, J. and Romano, D. M. (2010).

The implications of computer game technology on society are for example the Kinect allows for greater interactivity and providing a fitness option that if used will help improve the overall health of society. Also if Full body Motion control is implemented in care homes for the elderly to use society will benefit from a better cared for elderly population with improved quality of life which is even more useful now that society has an ageing population much more than before due to greater life spans. Furthermore pervasive gaming effects society by allowing for greater interactivity as well as exercise in a computer game while playing with many others in such a social game, this therefore allows for a much greater experience when playing these games and society becomes healthier as a result. Should games become aware of our emotional state and be able to act on it society would benefit from a population with improved emotional states and therefore mental stability. Therefore there are several implications of computer game technology which could be of benefit to not only the games market but also society itself.

1. **Limitations**

The limitations of Human-Computer Interaction as with many other current developing technologies are the developer’s imagination and the user’s requirements. As the technologies produced get more and more sophisticated, it will come to a choice of the developers and the users as to whether it is practical to continue developing Human-Computer Interaction, there may be ethical issues involved such as the creation of a true Artificial Intelligence that can handle many responsibilities as well as be aware of humans emotional state to the point where a conversation with an AI would seem no different than with a human being. In the context of computer games an AI would perform these functions in background while the user experiences the game, such as dynamically altering a games difficulty to better match the users skills, this is supported by the work of Um, S. *et al.* (2007). Also the ethical issues are how to deal with an AI, what precautions or safeguards should be taken in case there is an issue with the AI that could lead to harm to a human being.

Should sensor technologies develop to the point where the Computer Game Interaction is on a more physical level such as computers embedded into ourselves in order to more easily interact with Computer Games ethical questions should be raised as to whether this is appropriate as this would change our definition of ourselves by embedding computers into ourselves we then become more machine and less human being. Therefore there are limitations to Human-Computer Interaction but it is less of a technical issue and more of an ethical one that must be considered before developing these sensor technologies.

1. **Similar Technologies**

A technology similar to Computer Game Interaction is Human-Computer Interaction (HCI) which quite simply is how users interact with computers this is partly supported by the work of Sumathi, S. *et al.* (2010), this is similar to Computer Game Interaction as HCI is concerned in the broad theme of how humans interact with computers such as with graphical user interfaces, speech recognition or a mouse and keyboard etc, this is supported by the work of Murphy, G.R.S and Jadon, R.S. (2011). This is much like Computer Game Interaction which is solely concerned with how humans interact with Computer Games with input devices such as game pads, motion control and joysticks. Therefore it is clear that HCI is quite similar to Human-Computer Interaction as Human-Computer Interaction is clearly HCI but focused on the sensor technologies used in computer games.

1. **Conclusion**

In this report I have given a brief introduction to Computer Game Interaction, detailing its uses such as for the elderly in care homes to help keep them active and how this impacts on society for example by having computers in most objects interconnected in one form or another as well as giving the user a fitness option in computer games, its limitations such as ethical consideration with future developments and similar technologies such as Human-Computer Interaction. This paper provides the reader with enough information on Computer Game Interaction to understand its themes while not being so technical in nature that those unfamiliar with the topic will have issue with this report.

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***Fill in your name and student number in the marksheet below:***

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| Student Name /Number: James Braznell 1007022 Grade: C8  Marker’s Name: Dr R. A Simpson Date: 15th April 2013 |

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| **PART A:**  **LO1**  KNOWLEDGE:  The background/Context of the technology’s emergence, ie from what other technology has it emerged or evolved?  A discussion of any existing similar technologies, if appropriate; and the salient features of the technology.  EVALUATION  A discussion of possible uses or markets; and the future impact of the technology  PRESENTATION  Structure: contents page; numbering; abstract; conclusion; references; etc  Style:  Written in an appropriate academic style, with references? | **A** | **B** | **C** | **D** | **E** | **F** |
| An excellent, well-rounded, discussion of the technology and its emergence. | You have discussed all aspects of the technology and its emergence in some depth. | You have given a mainly descriptive account of the technology and its emergence. | The facts are presented, system of citing sources limited but useable. | You have made cursory mention of the technology and its emergence.  Over-reliance on a few sources; and poor use of citations. | The technology’ or its emergence does not get a mention at all.  Citations have not been used to identify sources of any material used within the body of the report. |
| An excellent, well-rounded, evaluation of the possible uses , markets and future impact of the technology | You have evaluated in a limited way the technology’s possible uses, markets, and future impact in some depth | You have highlighted, the possible uses , markets, and the future impact of the technology | You have mainly described the technology’s possible uses, markets, and future impact. | You have made cursory mention of the technology’s possible uses, markets, or future impact. | The technology’s possible uses, markets, or future impact do not get a mention at all |
| An excellent structure, easy to navigate, easy to read (document standards compliant; consistency; summaries)  You have written in a clear, concise, academic style, which has been appropriately referenced. | Very good structure (easy to navigate, easy to read).  Your style is clear and concise, and is largely academic in style and suitably referenced | A good structure that is relatively easy to navigate and comprehend.  Harvard referencing is used accurately. There may be some spelling, grammar, and punctuation issues affecting clarity in places. | A satisfactory structure but not always logically presented; and lacking appropriate sizing of section s and sub-headings.  Harvard referencing is used, but some errors in places.  The essay is not written in the 3rd person. | Poorly structured essay;  and, your style of writing is poor. | A poor effort;  Difficulty in navigating and comprehending content;  written in a non-academic style;  Poorly cited (or referenced )  or not cross-referenced at all! |
| **LO2:**  Critique and summarise technological presentations | Excellent appreciation of the content and constructive review of both technology presentations. | Excellent appreciation of content and constructive review of most of the technology presented. | Some appreciation of subject and a good review given of the technologies presented. | A general description of technology given, lacking in some areas. | Poor review, showing general lack of awareness of content and the presentation. | Presentations not attended. Review unacceptable. |

Comments

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| Competence in using your sources, cited and referenced (not in a bibliography) to strengthen your arguments, would make your work much more credible. |