Virtual Gaming



**B.S. (CS) Final year Project Report**

**Submitted by:**

**Anbreen Jahan 2015/COMP/BSCS/18572 1518442**

**Juwairiah Saleem 2015/COMP/BSCS/18591 1518460**

**Mahwish Naseem 2015/COMP/BSCS/18595 1518464**

**Naveera Jamil 2015 /COMP/BSCS/18599 1518468**

**Project Advisor:**

**Miss Ummay Fasiha**

**Miss Anisa Ahmed**

**July 2018**

**Department of Computer Science and Information Technology**

##### Jinnah University for Women

5-C Nazimabad, Karachi 74600

**ABSTRACT**

Brain-computer interface (BCI) is a progressing area that has been adding this whole new dimension of capability to HCI. BCI has created a unique communication channel, mainly for the ones who're incapable to generate the required muscular movements in their daily life to control the common devices[1]. The patients who suffer from Thalassemia or dialysis undergo painful treatments with time duration of 2-3 hours which is quite long. The engagement of their hands due to the canola drips makes them even more mentally disturbed. They are unable to carry out any task utilizing hands and feet except from watching the screens which can be very exhausting after some time. They need some enjoyable entertainment especially during their treatment to divert their mind from the pain they endure. Furthermore, Studies shows that the ADHD (Attention deficit hyperactivity disorder) patients are also treated by the neuro-feedback, since they tend to lose the focus easily very often. Taking these issues in consideration, we proposed a solution called Virtual Gaming, which comprises of an EEG (electroencephalogram) headset. EEG safely measures brainwave signals and monitors the concentration and attention levels of users as they interact with the system in order to play the game[2][3]. The proposed solution aims to provide those patients an ease and means of entertainment during the treatment without any involvement of the hands. Also, the proposed system acts as a mind booster for normal people to increase attention, focus and concentration.

# **Table Of Content**

[**ABSTRACT** ……………………………………………………………………………………………………………………………………………………….ii](#_Toc518597504)

[**Table Of Content** iii](#_Toc518597505)

[**List Of Figure** v](#_Toc518597506)

[**ACKNOWLEDGEMENT** vi](#_Toc518597507)

[**CHAPTER 1** 2](#_Toc518598052)

[**SOFTWARE REQUIREMENT SPECIFICATION** 2](#_Toc518598053)

[**1.1** **PURPOSE** 3](#_Toc518598054)

[**1.2** **PRODUCT SCOPE** 3](#_Toc518598055)

[**1.2.1** **For Kidney or Thalassemia Patients** 3](#_Toc518598056)

[**1.2.2** **For Paralyze Patients** 3](#_Toc518598057)

[**1.2.3**  **New Experience to Gamers** 3](#_Toc518598058)

[**1.3** **OVERALL DESCRIPTION** 3](#_Toc518598059)

[**1.3.1** **Product Perspective** 4](#_Toc518598060)

[**1.3.2** **Product Function** 4](#_Toc518598061)

[**1.3.3** **User Characteristic** 4](#_Toc518598062)

[**1.3.5** **Design and Implementation Constraints** 4](#_Toc518598063)

[**1.3.6**  **User Documentation** 4](#_Toc518598064)

[**1.3.7** **Assumption and Dependencies** 4](#_Toc518598065)

[**1.4** **SYSTEM FEATURES** 5](#_Toc518598066)

[**1.5** **OTHER NON-FUNCTIONAL REQUIREMENT** 5](#_Toc518598067)

[**1.5.1** **Performance Requirement** 5](#_Toc518598068)

[**1.5.2** **Safety Requirements** 5](#_Toc518598069)

[**CHAPTER 2** 6](#_Toc518598070)

[**ANALYSIS AND DESIGN** 6](#_Toc518598071)

[**2.1** **WORK FLOW DIAGRAM** 6](#_Toc518598072)

[**2.2** **RELATIONAL MODEL** 6](#_Toc518598073)

[**2.3** **USE CASE DIAGRAM** 7](#_Toc518598074)

[**2.4** **ACTIVITY DIAGRAM** 7](#_Toc518598075)

[**2.5** **DEPLOYMENT DIAGRAM** 8](#_Toc518598076)

[**2.6** **OTHER DIAGRAM** 8](#_Toc518598077)

[**2.6.1** **ER Diagram** 8](#_Toc518598078)

[**CHAPTER 3** 9](#_Toc518598079)

[**TOOLS AND TECHNOLOGY** 9](#_Toc518598080)

[**3.1** **SOFTWARE** 9](#_Toc518598081)

[**3.1.1** **Arduino IDE** 9](#_Toc518598082)

[**3.1.2** **3D Max** 9](#_Toc518598083)

[**3.1.3** **Photoshop CS6** 9](#_Toc518598084)

[**3.1.4** **Tera term** 9](#_Toc518598085)

[**3.1.5** **Unity 3D** 10](#_Toc518598086)

[**3.2** **HARDWARE** 10](#_Toc518598087)

[**3.2.1** **Mind Flex EEG Headset** 10](#_Toc518598088)

[**3.2.2** **Arduino Leonardo** 10](#_Toc518598089)

[**CHAPTER 4** 11](#_Toc518598090)

[**USER INTERFACE DESIGN** 11](#_Toc518598091)

[**4.1** **WEB USER INTERFACE** 11](#_Toc518598092)

[**4.1.1** **Contact Form** 11](#_Toc518598093)

[**4.2** **HARDWARE INTERFACE** 11](#_Toc518598094)

[**4.2.1** **EEG Headset connection with Bluetooth Module** 11](#_Toc518598095)

[**4.3** **GAME USER INTERFACE** 12](#_Toc518598096)

[**4.3.1** **Splash Screen** 12](#_Toc518598097)

[**4.3.2** **Main Screen** 12](#_Toc518598098)

[**4.3.3** **Car Selection** 13](#_Toc518598099)

[**4.3.4** **Level Selection** 14](#_Toc518598100)

[**4.3.5** **Game Over** 14](#_Toc518598101)

[**IMPLEMENTATION** 15](#_Toc518598102)

[**5.1** **WEBSITE DESIGN** 15](#_Toc518598103)

[**5.1.1** **Home** 15](#_Toc518598104)

[**5.1.2** **Features** 16](#_Toc518598105)

[**5.1.3** **Project Components & Team** 17](#_Toc518598106)

[**5.1.4** **Contact** 18](#_Toc518598107)

[**5.2** **GAME DESIGN** 19](#_Toc518598108)

[**5.2.1** **Splash Screen** 19](#_Toc518598109)

[**5.2.2** **Main Screen** 19](#_Toc518598110)

[**5.2.3** **Level Selection** 20](#_Toc518598111)

[**5.2.4** **Game Over** 20](#_Toc518598112)

[**CONCLUSION** 21](#_Toc518598113)

[**APPENDIX A** 22](#_Toc518598114)

[**A.** **Glossary** 22](#_Toc518598115)

[**REFERENCES** 25](#_Toc518598116)

# **List Of Figure**

[Figure 2‑1: Work flow Diagram 6](#_Toc518596893)

[Figure 2‑2: Relational Model 6](#_Toc518596894)

[Figure 2‑3: Use Case Diagram 7](#_Toc518596895)

[Figure 2‑4: Activity Diagram 7](#_Toc518596896)

[Figure 2‑5: Deployment Diagram 8](#_Toc518596897)

[Figure 2‑6: Entity Relationship Diagram 8](#_Toc518596898)

[Figure 4‑1:Contact Form 11](#_Toc518596899)

[Figure 4‑2:Splash Screen 12](#_Toc518596900)

[Figure 4‑3:Main Screen 12](#_Toc518596901)

[Figure 4‑4:Car Selection Buggy 13](#_Toc518596902)

[Figure 4‑5:Car Selection Sedan 13](#_Toc518596903)

[Figure 4‑6:Level Selection 14](#_Toc518596904)

[Figure 4‑7:Game Over 14](#_Toc518596905)

[Figure 5‑1:Home 15](#_Toc518596906)

[Figure 5‑2:Features 16](#_Toc518596907)

[Figure 5‑3:Project Components & team 17](#_Toc518596908)

[Figure 5‑4:Contact 18](#_Toc518596909)

[Figure 5‑5:Splash Screen 19](#_Toc518596910)

[Figure 5‑6:Main screen 19](#_Toc518596911)

[Figure 5‑7:Level Selection 20](#_Toc518596912)

[Figure 5‑8:Game Over 20](#_Toc518596913)

# **ACKNOWLEDGEMENT**

First of all, we thank to Almighty Allah who gives us the strength and ability to think, work and deliver what we are assigned to do. Secondly, we must be grateful to our course in charge Miss Fasiha and Miss Anisa who guided us in this project. We also acknowledge our teachers who guided, taught and helped us during our whole study period.