STUDENT INDUSTRIAL INTERNSHIP PROGRAMME LOGBOOK

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Matric No:	24715
Programme:	BUSINESS INFORMATION SYSTEM (BIS)
Place of Training:	MURDOCH UNIVERSITY, AUSTRALIA
Period of Training:	6TH MAY 2019 TO 6TH DECEMBER 2019
Project Title:	NEUROMENDER (a home computer-based stroke rehabilitation system)

LOG BOOK **WEEK NO: 9–10**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
9	1st July 2019	• Meeting with supervisors • Campus tour: lab and equipment
	2nd July 2019	• Project briefing and project management software
	3rd July 2019	• Research paper reading about multi-user collaborative immersive virtual environment and design module for project
	4th July 2019	• Research paper reading regarding Photon Unity Networking (PUN)
	5th July 2019	• Presentation idea regarding project
10	8th July 2019	• Photon Unity Networking setup
	9th July 2019	• Photon Server
	10th July 2019	• Installation MySQL • Study on Authentication
	11th July 2019	• Connect to Self-Hosted Photon server
	12th July 2019	• Setup network for Photon Unity Networking(PUN)

Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR					
Instruction to Host Company Supervisor Please refer to the student's to assess his/her performance. Please award the scores based on the range below:					
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Initiative & Creativity	Had little observable drive and did not have new ideas	Some observable drive and some new ideas	Mostly self-starter and sometimes sought new challenges and offered new ideas	Always a self-starter and consistently sought new challenge and offered new creative ideas	**/5**
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				Total Score	**/20**
Comments:					
Host Company Supervisor's Signature & stamp:					
Name & Designation:					
Date:					

(make copies if necessary)

DETAIL REPORT **WEEK NO: 9**

Objective(s) of the activities:

- Meeting with supervisor and project briefing
- Hardware setup

Contents:

My friend and I met Dr. Fairuz and Shri Rai, our supervisors as this is the first day we arrived at Murdoch University. We have a short meeting to introduce ourselves and they brief us regarding the Science and Technology Faculty in Murdoch University.

We also have been explained regarding our staff ID, access card and a little introduction to our project. We have been told that we need to have a working prototype by the end of our internship.

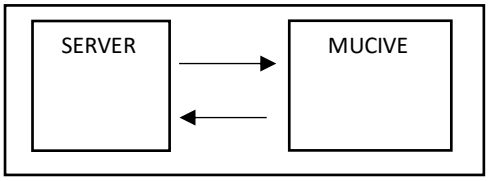
After that, they gave us tour around the campus and show us the new equipment like CaptoGlove, Hololens, HTC VIVE and etc. Then, we have been assigned to our lab where we had our own computer and place as our workplace.

We need to setup several equipment and devices in the lab which are VR Vive, Window Mixed Reality (WMR) and Hololens. We followed tutorials in the internet and YouTube videos to set them up.

Regarding the **project briefing**, we have been informed regarding a few things:

1. This project has 2 parts which are Core Technology and a module.
2. The Core Technology has two components which are server and Multiuser Collaborative Immersive Virtual Environment (MUCIVE) that need to be integrated to each other.

[Part 1]



3. Engine used to develop the system is Unity.
4. Module are separated from Core Technology and need to be inserted in the system after Part 1 is fully developed. There are a few different scenes in the module.

DETAIL REPORT **WEEK NO: 9**

Objective(s) of the activities:

- Project management software

Contents:

Dr. Fairuz suggested two project management software which are GitHub and Bitbucket. I did a research about these two and made a comparison between them. Here are the features of the two projects management software.

Features of GitHub:

1. Unlimited public repository for free.
2. An integrated issue tracker right within your project.
3. Milestones and labels within projects.
4. High level of usage in open source projects.
5. Support for over 200 programming languages and data formats.

Features of Bitbucket:

1. Charge a fee for user more than 5.
2. Free issue tracker and wiki.
3. Integration with tools like Jira, Crucible, Bamboo, Jenkins
4. Bitbucket own a server to keep all data, Bitbucket server.
5. Unlimited private repos.

We choose GitHub for our project management software.

DETAIL REPORT **WEEK NO: 9**

Objective(s) of the activities:

- Research paper reading about multi-user collaborative immersive virtual environment

Contents:

I did a reading about multi-user collaborative immersive virtual environment(MUCIVE) research paper since we need to design the module for the project. Dr. Fairuz suggested to look into Dr. Doug Bowman to get more information about MUCIVE.

We found that we can use Photon Unity Networking (PUN) for multiuser.

I did some reading about an article entitled "Collaborative Virtual Environments; An introductory review of issues and system.

It emphasizes on adding the "Collaborative" to Virtual environment.

1. Observations of co-operative and collaborative work
2. Characterized collaborative work;
   i) Shared and individual activities
   ii) Flexible and multiple viewpoints
   iii) Sharing context
   iv) Awareness of others
   v) Negotiation and communication

It also suggested a few suggestions from their experiment on Wireless and multi-user platform that can have greater freedom of movement.

1. Using backpack computer connected to VR, headset connected to Wi-Fi with motion capture workstation.

2. Providing 1 ton of server/client architecture allowing multiple users to share the same physical space and virtual environment.

DETAIL REPORT **WEEK NO: 9**

Objective(s) of the activities:

- Research paper reading regarding Photon Unity Networking (PUN)

Contents:

We decided to use Photon Unity Networking (PUN. We did some research on Photon and how it works on Unity and on multiuser virtual reality.

Photon Unity Networking (PUN) is a Unity package for multiplayer games. Flexible matchmaking gets your players into rooms where objects can be synced over the network. RPCs, Custom Properties or "low level" Photon events are just some of the features.

The fast and (optionally) reliable communication is done through dedicated server(s), so clients don't need to connect one to one.

Photon provided a server which is Photon Cloud server free up to 20 con-current users. However, user can get up to 100 con-current users by downloading PUN SDK to install license for self-hosted server.

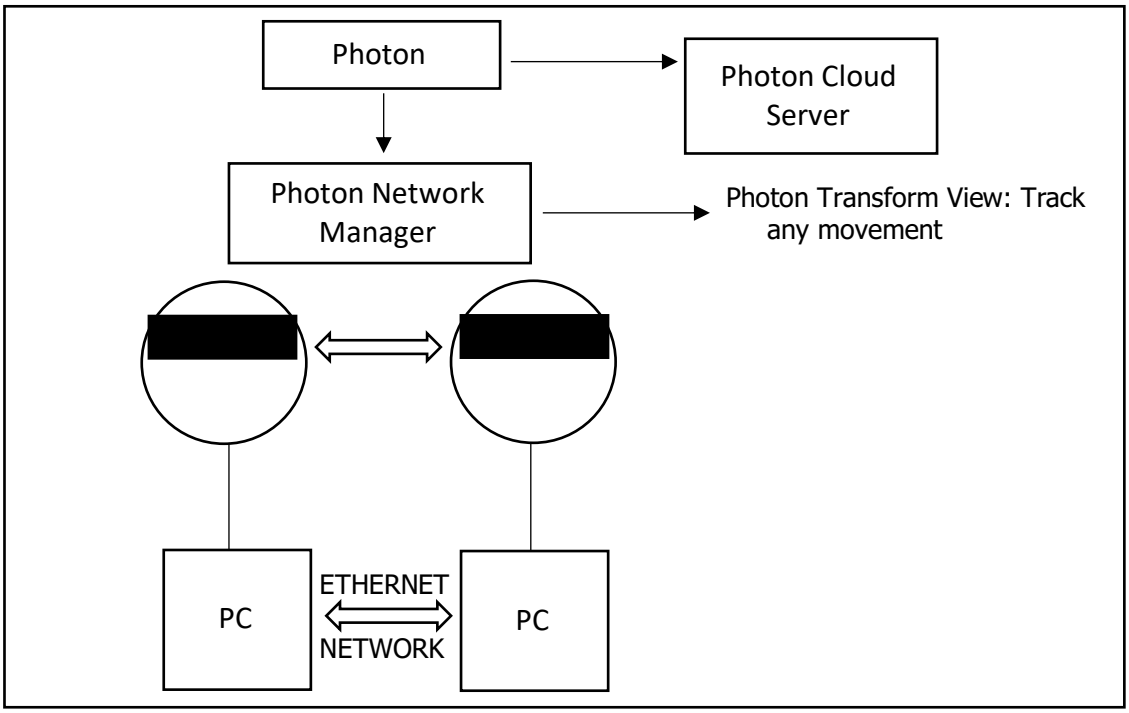
DETAIL REPORT **WEEK NO: 9**

Objective(s) of the activities:

- Presentation idea regarding project

Contents:

We presented the idea regarding how the Core Technology is done. This is the design that we come out:



1. Connecting two PCs using Ethernet while Head-Mounted Devices (HMD) connected through Photon Unity Network Manager.
2. With two HMD connected, the Multiuser Collaborative Immersive Virtual Environment (MUCIVE) will occurred.
3. Photon Cloud server is a provided server to store data. Alternatively, Photon also provides a license for self-hosted server.

DETAIL REPORT **WEEK NO: 10**

Objective(s) of the activities :

- Photon Unity Networking setup

Contents :

I studied PUN documentation and find out what is the **Steps to setup PUN:**

1. Open the Asset Store and locate the PUN 2 asset
2. Download/install it. Let Unity Recompile when you have imported all the PUN Assets.
3. Then, connects to a "Name Server". It checks which app (with the AppId) and which region the client wants to use. Then it forwards the client to a Master Server.
4. The Master Server is the hub for a bunch of regional servers. It knows all existing games. Any time a game (room) gets created or joined, the client gets forwarded to one of the other machines - called "Game Server".

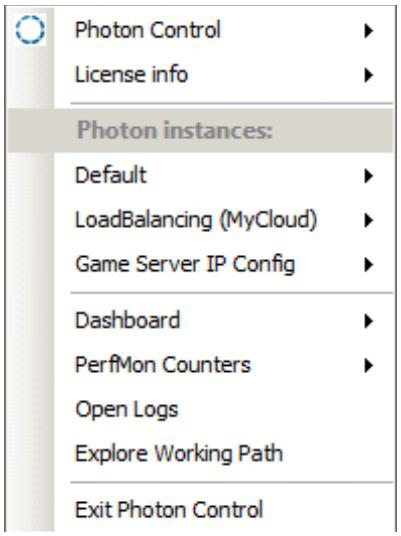
DETAIL REPORT **WEEK NO: 10**

Objective(s) of the activities :

- Photon Server

Contents :

I was partnered with Nur Nabilah for server connection. We started "PhotonControl.exe" and added an icon to the tray bar. This Photon Control can be found from the files of downloaded Photon page. Photon Control is a control User Interface (UI) for Photon. Photon Control allowing the user to start and stop Photon services, LoadBalancing (MyCloud), setup and open Photon`s performance (PerfMon) counters, Open log files, open working path, IP configuration, statement of your latest version of Photon.



The tray bar will blink to indicate that the application is running. This is also an indication that Photon Control is running.

Dr. Fairuz suggested that we use the 100-concurrent users (CCU) Photon license. We need to download the license and the setting will change once we restart the Photon Control. For this license, we need to host our own server.

There are a few challenges and difficulties that we faced while setting up the Photon:

- We followed the documentation on how to setup the server but the server is failed to be setup.

- We cannot find the license at first and the default setting for the Photon control is 20-concurrent user but we managed by searching through the documentation.

- We still confused on to setup the self-hosted server. We tried to do some reading and research on the Internet on how to set it up.

DETAIL REPORT **WEEK NO: 10**

Objective(s) of the activities :

- Installation MySQL
- Study on Authentication

Contents :

For the database, each of us tried to install MySQL in our PC. MySQL is an open-source relational database management system (RDBMS). I searched on how to set it up in MySQL documentation.

1. Download MySQL Installer from https://dev.mysql.com/downloads/installer/ and execute it.

2. Complete the installation process by following the instructions provided. This will install several MySQL products and start the MySQL server.

3. MySQL is now installed. We can configure MySQL as a service. This will make the Windows will automatically start MySQL server every time we restart our system.

4. We also installed other helpful MySQL products like MySQL

This process also installs the MySQL Installer application on the system, and later it can be use to upgrade or reconfigure the MySQL products.

I also studied about PUN authentication. PUN provides a few types of authentication like Facebook authentication, STEAM authentication and custom authentication.

DETAIL REPORT **WEEK NO: 10**

Objective(s) of the activities :

- Connect to Self-Hosted Photon server
- Setup network for Photon Unity Networking(PUN)

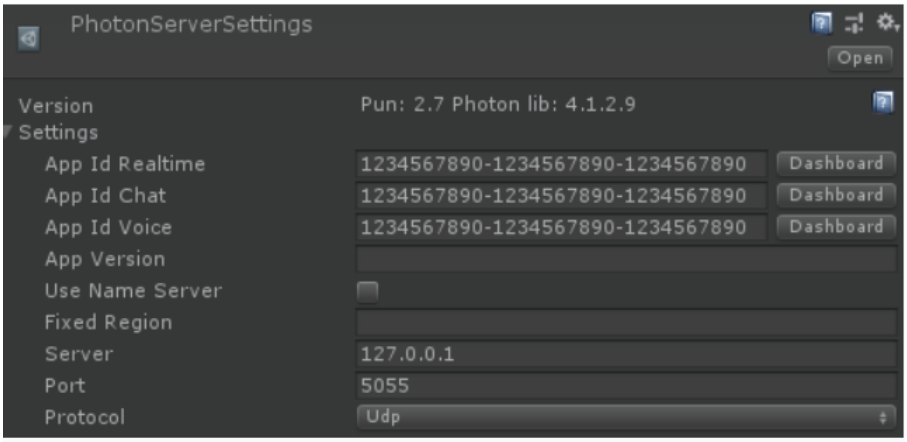
Contents :

To allow connection between server and user, I need to set the self-hosted server. Here are the steps:

1. Register for a new (free) Photon Cloud account by entering an email or copy and paste an existing AppId from the Dashboard. Done.

2. I want to set the self-hosted server, so I click 'skip' and I just need to call PhotonNetwork.ConnectUsingSettings() in my code.

I also can use PhotonNetwork.ConnectToMaster() as alternative PhotonNetwork.ConnectUsingSettings() to connect to my own Photon Servers. This is useful when to use the host Photon On-Premises. I need to provide a master Server Address and a port for ConnectToMaster(). The address is either On-Premises DNS name or an IP. I can include the port after a colon (then pass 0 as port) or can pass the port separately.



Challenges that I faced:

1. I tried the code using PhotonNetwork.ConnectToMaster() and input the IP address and port but the code has error and need to fixed it.

2. I need to put .dll files in the asset folder and add references to Visual Studio (VS) but VS said the files are already in the VS but the code still not been fixed.

LOG BOOK **WEEK NO: 11–12**

WEEK NO	DATE	BRIEF DESCRIPTION OF DAILY ACTIVITIES
11	**15th July 2019**	• Connecting PUN to server • Setting up XAMPP
	16th July 2019	• Practicing PUN basic tutorial • Read documentation on Photon Server
	17th July 2019	• Understanding connection of Photon server
	18th July 2019	• Configure the connection of database
	19th July 2019	• Installing and setting up MySQL Workbench
12	**22nd July 2019**	•
	23rd July 2019	•
	24th July 2019	•
	25th July 2019	•
	26th July 2019	•

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Total Score					**/20**
Comments:					
Host Company Supervisor's Signature & stamp:					
Name & Designation:					
Date:					

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DETAIL REPORT **WEEK NO: 11**

Objective(s) of the activities :

- Connecting PUN to server
- Setting up XAMPP

Contents :

We tried to connect to the self-hosted server again and read the documentations on Photon website. Then, we tried learning XAMPP server and install it and run it on LocalHost. However, we still cannot figure out how to connect the server to Unity.

Then, we tried to follow the basic tutorial PUN starting from setting up a PUN until Lobby User Interface. We unchecked the server name in PhotonServerSetting in Unity, input the server IP address and the port. We connected to the master server.

There are still a few confusions on the connection:

- Is Photon server can connect to own server such as XAMMP and own database like MySQL.
- Where can we retrieve data from Photon server?

Challenges I was facing along the way were:

- The server was connected to Photon Cloud instead of Self-Hosted Server.
- XAMPP that we installed has an error that stated “MySQL was unexpectedly shutdown”. Therefore, the connection was not established.

DETAIL REPORT **WEEK NO: 11**

Objective(s) of the activities :

- Practicing PUN basic tutorial
- Read documentation on Photon Server

Contents :

We tried again regarding the connection by changing the IP address from local to public. If we set the Local IP address, the connection establish and the Unity get connected to the server. If we set Public IP address, the connection cannot be established.

Then, we setting up the database. XAMPP was installed and established the connection to LocalHost and start the PhpMyAdmin. We tried creating authentication standalone by connecting PlayFab to the server. It was successfully connected. However, we just figured it out that it was integrated with Photon Cloud instead of Sel-Hosted Server.

Challenges I was facing along the way were:

- Integration of Unity with database. The connection was established but the Unity cannot retrieve the data from the database.

- Integrating Playfab database to Unity. Playfab requires AppID of Photon PUN. PlayFab will connect to PhotonCloud and data will store in it.

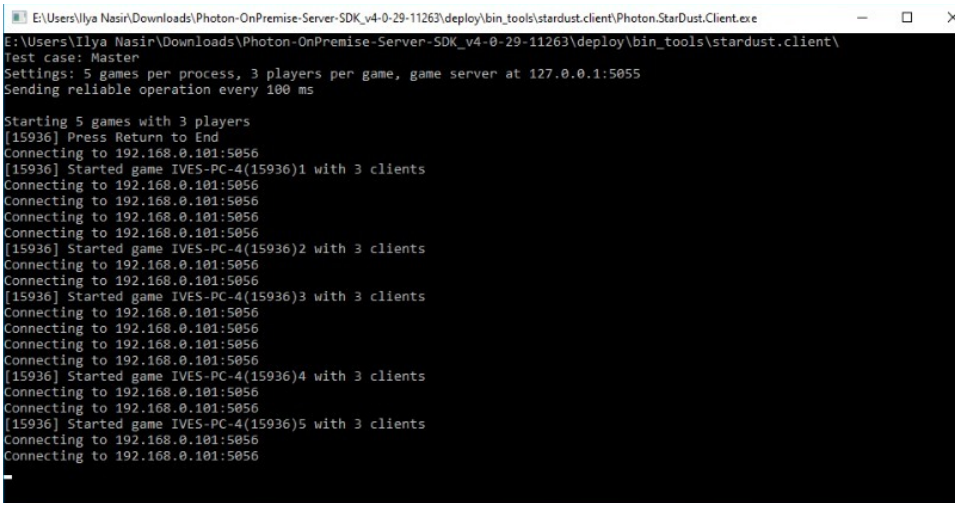
DETAIL REPORT **WEEK NO: 11**

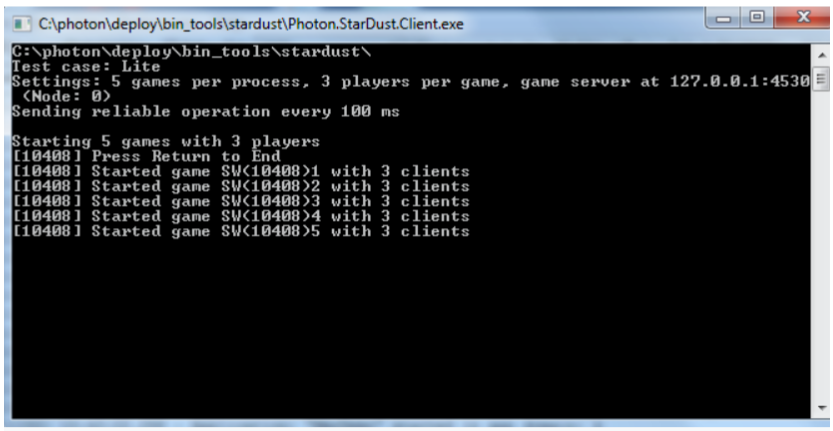
Objective(s) of the activities :

- Understanding connection of Photon server
- Configure the connection of database

Contents :

I read documentation of Photon server. Nabilah and I tried to understand about LoadBalancing of Photon server. Then, we set the Local IP address and run the "Run Test Client" to know whether connection established or not. The test was run as a client side to get connected to master server.





Photon Server Screenshot: Test Client

The first figure shows that the client is trying to “connecting” to Photon Server.

Photon LoadBalancing is running and will open 2 different applications which are Game Server and Master server.

Challenges:

- I am still confused about the change in the IP address either I need to change at Master server or Game server.

- I am still wondering either Game Server or Master Server will get connected to the photon server?

- We are trying to confirm that the connection is established by getting it connected form other PC in the lab using the same IP address.
  Result: The PC is trying to connect but it cannot.

DETAIL REPORT **WEEK NO: 11**

Objective(s) of the activities :

- Installing and setting up Mysql Workbench

Contents :

We decided to use MySQL Workbench Community because we can see the table and the database through their User Interface Visualization. After created the database in the MySQL, then we tried to integrate with Unity.

We can connect the database with the authentication in Unity. However, when we want to build it, it cannot retrieve the data from database. We followed several tutorials in the website and YouTube.

Challenges:

- Is it the localhost of the database or Ip address of the PC that we need to use to connect to database when coding the .cs file.