

**STUDENT INDUSTRIAL INTERNSHIP PROGRAMME LOGBOOK**

**SIT LOGBOOK REPORT**

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**Matric ID : 24606**

**Programme : Information Technology (IT)**

**Place of Training : Universiti Teknologi PETRONAS / Murdoch University, Australia**

**Period of Training : 7 months**

**LOG BOOK WEEK NO: 9–10**

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| **WEEK NO** | **DATE** | **BRIEF DESCRIPTION OF DAILY ACTIVITIES** |
| **9** | **1/07/2019** | * Meeting with supervisor |
| **2/07/2019** | * Hardware setup, project briefing |
| **3/07/2019** | * Github and Bitbucket |
| **4/07/2019** | * Human Interaction research paper |
| **5/07/2019** | * Presentation idea for core technology * Photon Unity Networking (PUN) |
| **10** | **8/07/2019** | * Photon Unity Networking (PUN) |
| **9/07/2019** | * Photon Control * Photon server setup |
| **10/07/2019** | * Photon Networking Setup |
| **11/07/2019** | * To build up master server |
| **12/07/2019** | * To setup Photon Unity Networking |

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| Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR | | | | | |
| I**nstruction to Host Company Supervisor**  Please refer to the student’s to assess his/her performance.  Please award the scores based on the range below: | | | | | |
| **Student’s Score** | **Beginning**  **(<2.0)** | **Developing**  **(2.0 to <3.25)** | **Accomplished**  **(Rare)**  **(3.25 to <4.0)** | **Exemplary**  **(Exceptionally Rare)**  **(4.0 to 5.0)** | **Score** |
| 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** |
| Task Accomplishment & Commitment | Partially accomplished given task despite full supervision | Accomplished given task but with full supervision | Accomplished given task but with some supervision | Accomplished given task with very minimum supervision | **/5** |
| Attendance & Punctuality | Frequently absent and always late | Sometimes absent and sometimes late | Never absent and almost always on time | Never absent and always on time | **/5** |
| Attitude & Self Control | Unable to demonstrate positive attitude and hardly maintained self-control under pressure | Occasionally demonstrated positive attitude and occasionally maintained self-control under pressure | Sometimes demonstrated positive attitude and maintained self-control under pressure | Consistently demonstrated positive attitude and consistently maintained self-control under pressure | **/5** |
| Total Score | | | | | **/20** |
| **Comments:** | | | | | |
| **Host Company Supervisor’s Signature & stamp:** | | | | | |
| **Name & Designation:** | | | | | |
| **Date:** | | | | | |

*(make copies if necessary)*

**DETAIL REPORT WEEK NO: 9**

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| **Objective(s) of the activities :**   * **Meeting with supervisor** |
| **Contents :**   |  |  | | --- | --- | | Details | Outcomes: | | Meeting supervisor | * we were brief about staff ID, access card, a brief description about project * we need to have a working prototype by the end of the our internship period * a weekly delivery progress * we were asked to setup several device in the lab. | | Campus tour | * we were introduced to several equipment that were used by seniors to develop project * We were introduced to rooms, equipment and buildings around the campus. | |
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**DETAIL REPORT WEEK NO: 9**

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| **Objective(s) of the activities :**   * **Hardware setup, project briefing** |
| **Contents :**   |  |  | | --- | --- | | Details | Outcomes: | | Hardware setup | * Devices that we setup are VR Vive, Window Mixed Reality (WMR) and Hololens * To setup the devices, we follow tutorials through internet and YouTube videos | | Project briefing | * The project 2 parts which are core technology and modules   + The core technology has two components that need to be integrated which are server and Multiuser Collaboration Immersive Virtual Environment (MUCIVE). The core technology needs to be developed first before the modules. The hardware specs for the MUCIVE are VR headset, haptic pen and glove, and AR headset.   + Engine used to develop the system is Unity.   + Modules are separated from the core technology and to be inserted in the system after core technology has fully developed. The modules act as plugin that contains different scene. * The idea of the whole project is to integrate component to multiuser and integrate it with set of hardware. * We need to read some research paper that relates to multiuser interaction | |
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**DETAIL REPORT WEEK NO: 9**

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| **Objective(s) of the activities :**   * **Github and Bitbucket comparison** |
| **Contents :**  As part of the task, I need to choose project management software to monitor project. There are two project managers that are Bitbucket and Github. Both could monitor project through dashboard. Figure below is comparison in terms of benefits made before choosing the best software to be used.   |  |  | | --- | --- | | **Bitbucket** | **Github** | | Charge a fee for user more than 5 | Unlimited public repository for free | | Bitbucket own a server to keep all data, Bitbucket server | Easy to contribute to an open source project | | Free issue tracker and Wiki | Provide a free wiki, issue tracker, project planner, a code review system | | Source code repository hosting does not charge a fee for each private repository | Allow source code repository to be posted to public | | Does have authentication via Github | Does have collaboration trough online bit and requires no setup for new user | |
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**DETAIL REPORT WEEK NO: 9**

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| **Objective(s) of the activities :**   * **Human Interaction research paper** |
| **Contents :**  The title of the paper is “*Human Interaction in Multi-user Virtual Reality”.* The research wants to find about the effect of absence of interaction partner to coordination task, the role of haptic feedback in transportation task. The outcome of the research paper are:   * The behavior of immersive Virtual reality. The immersion of artificial environment where user fee; just as immersed as they usually feels in real life. The author considers methods to setup the environment of immersive Virtual Reality environment and emphasis on feedback system between user and computer which stores information. The setup of devices needs understanding of nervous system and ability to manipulate nervous system. * Author compared between two environments, table below depicts the comparison.  |  |  | | --- | --- | | **Non-Immersive Multi-user environment (NIMUE)** | **Immersive Multi-user environment (IMUE)** | | Example of NIMUE are social network, chat program, trade fair and computer programs | Single framework | | NIMUE is most realistic in terms of real-time interaction | IMUE requires standard technical setup extended by three important features which are :   * Synchronous real-time tracking of multiple rigid body * Distribute application to render one virtual world from different perspective * Usage of avatar to enable user to identify and locate each other | |
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**DETAIL REPORT WEEK NO: 9**

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| **Objective(s) of the activities :**   * **Presentation idea for core technology** * **Photon Unity Networking (PUN)** |
| **Contents :**  We presented the idea on how to get the core technology done. As for core technology, the idea was to connect two PCs using Ethernet while the Head-Mounted Devices (HMD) connected through Photon Network Manager in Photon Asset. The engine that will run the Photon is Unity. With the two HMDs connected together, the Multiuser Collaboration Immersive Virtual Environment (MUCIVE) is realized.  To get the data collected from the device and the user, the computer needs to stores data in proper way. Photon serves Photon Cloud Server as an alternative to store all data. The Cloud server is connected to Photon Unity Networking. Therefore the PUN is setup along with the server. Otherwise, Photon also provides a license for its user to setup the server hosted by the user. We decided to host the server on our own. We chose to have the license to get max of 100 Concurrent User (CCU).  Photon Unity Networking (PUN) is unity package for Multiplayer games. It has a flexible matchmaking whereby the players can be synced through network. PUN is a reliable communication done through photon server. The PUN makes use of real-time Application Program Interface (API). PUN also can be used in cross-platform in which the project can be exported to mobile, desktop, web and other platform. |
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**DETAIL REPORT WEEK NO: 10**

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| **Objective(s) of the activities :**   * **Photon Unity Networking (PUN)** |
| **Contents :**  To setup the Photon Unity Networking (PUN), basic tutorial is followed. To setup the Photon Unity Networking (PUN) :   1. New project in Unity engine is needed as a platform to use the Photon Unity Networking (PUN) asset 2. Import the Photon Unity Networking (PUN) in Unity assert store. 3. Once the asset is imported, PUN wizard will show up and help with the network setting. PUN will handle the Photon Cloud. The Photon Cloud works:    1. Everyone connect to a “server name”    2. The Photon Cloud will check the AppId and region that user would want to use and forward to Master server, hub for bunch of regional server 4. Developer need to create a room to invite or let enter to use the room whenever connection is made. However, the room has limited number of player that can enter. 5. Lobby is created for your application exists on Master server. |
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**DETAIL REPORT WEEK NO: 10**

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| **Objective(s) of the activities :**   * **Photon Control** * **Photon server setup** |
| **Contents :**  Photon Control is a control UI for Photon. Starting "PhotonControl.exe" adds an icon to the tray bar. The application can be found in the files downloaded from Photon page. Once the Photon Control is run, the icon in the tray bar will blink showing that the application is running. Through Photon Control, user are allow to start and stop Photon, install, start and stop Photon services, change the game server configuration for "LoadBalancing (MyCloud)", setup and open Photon's Performance Monitor (PerfMon) Counters, open the log files, open working path in Explorer and verify you are using the latest version of Photon.  To get the max concurrent user (CCU) to 100 users, a license is downloaded and includes the files containing the Photon Control. The setting will change once the control is restart. I also try to setup server. Server that is needed to be setup is a self-hosted server. The architecture chosen is Client-server architecture. Tutorials on setting up a server are also followed but the server is failed to be setup.  Challenges that I were facing while setting up the Photon:   * I cannot find the Photon Control application in the downloaded files, but I overcome it by searching for tutorial documentation in the Photon website. * To change the max concurrent user in the Photon Control. At first setup the max concurrent user that is available was 20. After documentation about Photon Control is read, the concurrent user (CCU) is successfully updated to 100 mac CCU. * To configure the usage of Photon Control in setting up a self-hosted server, I am still trying to find out the usage of the Photon Control to understand the way of setting up a self-hosted server. |
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**DETAIL REPORT WEEK NO: 10**

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| **Objective(s) of the activities :**   * **Photon Networking Setup** |
| **Contents :**  To setup a connection between user through Unity. Through tutorial in YouTube, I tried to setup the networking in the Unity. The coding and method of setting up the network is followed one by one.  In the first part, the developer show how networking is setup by creating UI in Unity. The UI is then coded to allow networking. Photon.engine is imported in the Unity code to allow connection to master server of Photon. When all the setting is done, the project is run and tried to connect to master server. For the first part of the tutorial, the networking is successfully done. The project has connected to the master server.  I have tried to setup a server, by following the plugin setup of Photon Server. The file is created through Visual Studio. The end product of the files in build in .dll file.  Challenges I was facing along the way was:   * I am not sure the connection made in the Unity is connected to which server, either the Photon Control or my own server. |
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**DETAIL REPORT WEEK NO: 10**

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| **Objective(s) of the activities :**   * **To build up Master Server** |
| **Contents :**  To allow connection between user and server, I tried to code a build a server for a lobby based game. I followed a tutorial on *Photon Engine* website. By using Photon the LoadBalancing application in Photon Control works when clients connect to master server and get list of open games. Then clients create gamerooms, join certain gameroom by the name of the room or join random gameroom. The LoadBalancing layer is open source on both, the client- and the server side.  While trying to code, I follow the steps on how to create a class library. The class library created which compiles down to dll file is known as a server application. The file in charge of handling all server side logic in Photon. The setup of the files involves two classes, application and Peer. However the code has some error after compiling, which stops the coding to be built in the Visual Studio. The code needs to be reviewed and fixed the error to allow the connection.  Challenges I was facing along the way was:   * I am not sure the connection made in the Unity is connected to which server, either the Photon Control or my own server. |
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**DETAIL REPORT WEEK NO: 10**

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| **Objective(s) of the activities :**   * **To setup Photon Unity Networking** |
| **Contents :**  I tried to follow a tutorial on YouTube on how to setup the Networking in Unity again. This time, I tried to follow the tutorial until *“Game Setting”* tutorial using Singleton. In C#, Singleton is a class which allows a single instance to be created and give simple access to the instance. Singleton also ensuring the class has only a single globally accessible instance available at all times. Singleton is very useful in making global manager type class that hold global variable and functions.  While setting up the connection, the tutorial followed is not a tutorial to connect Unity project to connect to own dedicated server, whereas the tutorial shows how to get connected to the Photon Cloud using Photon ID and connect Unity to master server using the setting of PhotonNetworking function in coding. However, the tutorial is followed to get the main idea how the Photon Unity Networking Version 2 (PUN 2) is working in Unity. I was not following the whole tutorial as the setting was to be connected to Photon Cloud. The next step is to watch a tutorial on how to setup a dedicated server using Photon Server SDK.  Challenges I was facing along the way were:   * The Unity installed in the PC was in alpha version. A full version of Unity is needed to ensure stabilization of application when running the Photon Unity Networking (PUN) / any other element needed. Therefore, new full version Unity has been installed and used. * The networking is still connected to Photon Cloud and not my self-hosted server. I am still finding the tutorial to setup the server. * Understanding about setting up a server is still in progress as the step to setup a server need to be learned. |
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**LOG BOOK WEEK NO: 11–12**

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| **WEEK NO** | **DATE** | **BRIEF DESCRIPTION OF DAILY ACTIVITIES** |
| **11** | **15/07/2019** | * Connecting PUN to server * Setting up XAMPP |
| **16/07/2019** | * Practicing PUN basic tutorial * Read documentation on Photon Server |
| **17/07/2019** | * Understanding connection of Photon server |
| **18/07/2019** | * Installing and setting up Mysql Workbench |
| **19/07/2019** | * To fix Photon server error * Configure the connection of database |
| **12** | **22/07/2019** |  |
| **23/07/2019** |  |
| **24/07/2019** |  |
| **25/07/2019** |  |
| **26/07/2019** |  |

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| Logbook Weekly Evaluation by HOST COMPANY SUPERVISOR | | | | | |
| I**nstruction 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** |
| Task Accomplishment & Commitment | Partially accomplished given task despite full supervision | Accomplished given task but with full supervision | Accomplished given task but with some supervision | Accomplished given task with very minimum supervision | **/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: 11**

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| **Objective(s) of the activities :**   * **Connecting PUN to server** * **Setting up XAMPP** |
| **Contents :**  We continued to connect using self-hosted server to Photon Unity Networking (PUN) in Unity. Before that, we tried to learn about XAMPP server by installing the XAMPP component and run it on LocalHost. Unfortunately, we still cannot figure out how to connect the server to Unity. To figure out the connection, several documentations from Photon website were read. We tried to follow a tutorial in the documentation about basic tutorial on PUN in order to refresh the idea about setting up a PUN in Unity. The basic tutorial explains on how to develop own multiplayer powered by Photon Cloud and how to use Characters using Animator for their animations. The tutorial was followed until Lobby User Interface. After reading documentation in server part, we finally configured a way to make a connection between Photon server and Unity. By unchecking the server name in PhotonServerSetting in Unity, we can provide the server IP address in order to connect it. We tried to connect to Photon server by providing the IP address of our server. The connection was successfully connected to the master server. However, several things are still unsure :   * Whether we could connect the Unity to own server such as XAMMP and own database such as MySQL. * If the Photon server has been setup, where can we refer the data that have been collected   Challenges I was facing along the way were:   * Connection to the master server was connected to Photon Cloud and not our own server * Difficulty to setup XAMPP server as we need to identify the available port for connection. Errors occurs while we starting up the database, MySQL. Therefore the connection was not established. |
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**DETAIL REPORT WEEK NO: 11**

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| **Objective(s) of the activities :**   * **Practicing PUN basic tutorial** * **Read documentation on Photon Server** |
| **Contents :**  In relation to the yesterday problem, we did try again to follow the basic of PUN total to get the idea of setting up the PUN and connect it to Photon. We tried to change the IP address in PhotonServerSetting in PUN Unity to see if the connection changes when we change the IP address. The results showed in Unity console from the testing are :   1. If we set the IP address in PUN PhotonServerSetting the address of local IP, the connection establish and the Unity get connected to the server. 2. If we change the IP address to public IP of photon server or other IP address the output showing errors, the Unity could not get connected to server.   To get the PUN connected to server, we fixed the IP address in PUN PhotonServerSetting to local IP address. We moved setting up the database. XAMPP was installed in the computer and run. At first setup, the XAMPP application has establish connection to the localhost and phpmyadmin also started. Before trying to connect to database through XAMPP, we tried to connect the database to Playfab. All data can be transfer into playfab when Unity is run using the local IP address. However, when we tried to create database from the localhost error occurred.  Challenges I was facing along the way were:   * Connecting server to database, the connection on localhost was establish but the Unity cannot get connected to database. * Integrating Playfab database to Unity is not an easy task as the Playfab requires AppID of Photon PUN. When database in Playfab is created, all data is been stored in the cloud. |
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**DETAIL REPORT WEEK NO: 11**

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| **Objective(s) of the activities :**   * **Understanding connection of Photon server** |
| **Contents :**  To get more understanding about the connection on server, I read documentation of Photon server. I read about LoadBalancing of Photon server. The documentation actually has been revised before, but I still cannot get the main idea of how a connection is established. On the photon server application, we tried to 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. The result of the test is shown in the diagram below.    *Figure 2 Run Client Test Result on local PC Figure 1 Photon server screen shot*  The test shown the client is trying to connect but could not get connected as shown in the Photon server (Right picture). In the documentation, it is stated that when running the photon loadBalancing, it will start two different applications which are Game Server and Master server and whenever we choose local IP or public we have to setup firewalls, routers and switches. There are several things that I am not sure and still don’t understand, challenges I was facing along the way were:   * How to confirm the photon server is running using the IP address of PC. * Should we change the IP address in one of the server either Master server or Game server? In the documentation, there are short tutorials on changing the server IP address in loadBalancing.dll file. * As we running the server, which server will get connected to the photon server? Game server or Master server? More reading is need on this part. |
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**DETAIL REPORT WEEK NO: 11**

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| **Objective(s) of the activities :**   * **Installing and setting up Mysql Workbench** |
| **Contents :**  We tried to skip the connection to server part to focus on installing and setting up database. As for database to store clients’ data, we decided to use MySQL Workbench because it has and application interface that visualize your table and running server in one application. To setup a free database, we chose to download MySQL workbench community as it is free to download and use. After the connection in the MySQL server has been setup, we tried to figure out how to connect data from Unity to database of MySQL workbench.  Although we successfully establish connection of MySQL server, but we cannot connect the database to Unity. Several tutorials in the website and Youtube were followed but the setup is not using Photon server. But we tried the coding to get the idea of connecting the database and Unity. There are several questions and challenges that we need to overcome:   * Which address we need to use to connect to database when coding the .cs file? Is it the localhost of the database or Ip address of the PC? * In which files should the sql queries (the connection setup) placed? Is it in the cs? We tried to follow a tutorial, the tutorial code the connection setup in CSharp file by including namespace of system and mysql. However, when we run the code, there’s error that client cannot be authenticated and need to consider upgrading MySQL client. We are not sure about this error because the solution from website suggested that we Grant a privilege for the localhost, but the solution does not work as the same error keeps appearing. * Is database connection related to Photon server connection? Should we use the same IP address used in Photon server when establishing a database connection? We tried to include the IP address of Photon server (which is also an IP address of local PC) but the connection can’t be established. |
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**DETAIL REPORT WEEK NO: 11**

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| **Objective(s) of the activities :**   * **To fix Photon server error** * **Configure the connection of database** |
| **Contents :**  We again tried to connect to the Photon server using two IP addresses, Public and Local. We run the test client from loadbalancing but the outcome is still the same.   1. When connecting to Local IP address, the clients loop in state of trying to connect to the Photon server 2. When connecting to Public IP address, the status of clients is disconnecting. In the documentation provided in Photon website, it said that “*If you run the test client and notice some failures to connect or "Game does not exist" errors this might be explained by the fact that created Photon peers are trying to connect to the server or join rooms too soon. The solution to this "server-client race condition" is to delay the startup of the test peers using "StartupInterval" setting from "deploy\bin\_tools\stardust.client\Photon.StarDust.Client.exe.config".* The solution provided seems not completed because we don’t know the value to delay the startup. But we tried with some value, it does not working.   challenges I was facing along the way were:   * To configure whether the connection of Photon server has established or not. The connection is determined by trying to get connected form other PC in the lab using the same IP address. Result: the other computer cannot get connected to the Photon server and remain in the “trying to connect” state. * Connection to database. It is still in confusion on how to link Unity to database.   Today, I learned how to identify if the connection between PC is blocked by firewall or not. Using Command prompt and ping the IP address of the other PC that we would like to connect to will show the result. |
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