UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY CREATIVE INDUSTRIES

BACHELOR OF ARTS (HONS) GAME DESIGN

UJMZ 30510 FINAL PROJECT REPORT:

STRUCK BY OIL

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Chapter 1: Introduction and Overview

1.1 Motivation of the project

With the theme of Malaysian Folklore for our Final Year Project, my team is trying to present the feeling of the citizens on how they behave when folklore stories appear to the city. The first idea that came into our mind was the horror game. But, after we discussed the horror games genre we decided to reject the horror genre game because these games were having general gameplay and we don't want to do that and it cannot present how folklore really affects society and the citizens.

So, We decided to take a mysterious Malaysia's Folklore as our game theme which is the "Orang Minyak", and we set the player to not playing as a survivor but the mysterious creatures itself. My team was trying to explain how people behave to these Malaysia folklore when it happened to them by using the level and the environment to present the feel of the citizens.

My motivation for this project is exploring what people behave when facing these folklore situations, and what will happen in the real world and that's what I was motivated to present these kinds of stuff for the people to feel it.

1.2 Objective

The objective of this project is to create a pretty-decent quality game that can represent Malaysia's folklore and to let people come from another country to get to know about Malaysia had these kinds of folklore a long time ago.

1.3 Area/ Scope

The area of the project I am handling in this project is the Programming department, which covers the overall programming parts such as Player functions, Artifact Intelligent functions and behaviors, Particle systems and User-Interface functions. Therefore, my research will be looking at other successful stealth games and their AI function and mechanism on how to create a great 3D stealth game. Then implement some of it into our game

Research Topic

The influences of AI to the gameplay

Introduction

Nowadays, AI has played an important role in most video games. The implementation of the AI in the video games that create lots of improvement for the game development which can make the game more enjoyable such as monster move in Monster Hunter, Any Boss Fight in Action or RPG. Different genres have different designs for the AI but AI not only affects the game genre but also affects the difficulty of the game by changing the intelligence of the AI or the status of the AI in the game.

Research Question

1. How AI behaves influences the gameplay.
2. How developer design AI in different genres of game
3. Which aspect should be aiming for game developers in designing an AI for the games

Chapter 2: Background Study / Literature Review

2.1 Game background (AI, talk about AI in our game)

Our game background is based on Malaysia's Folklore which is the “Orang Minyak” story. In Malaysia, there are different versions of stories talking about the “Orang Minyak”. But, we used the latest version of the folklore that talking about the “Orang Minyak” was a supernatural creature that has been controlled by witches. “Orang Minyak” will stealth into the house and steal some goods or the order from the witch from the victims. So, this is what we come to in our mind and make it as a 3D stealth game.

Based on the research I had found, AI plays an important role in video games. AI not only influences the gameplay but also affects the gaming experience for the player. An AI must fit the game's intended experience. Some Game developers said that “The goal is not to create something unpredictable. What you want is an AI that’s consistent so that the player can give it certain inputs. The player can do things and expect the AI will react in a certain way”. A good AI is not having a smart action but a good AI must interact with the system.

In our project, we tend to make our AI more human-like that can have different characteristics inside the game instead of following the order or being programmed as a simple robot that follows the order. However, to make an AI be human-like is a very difficult thing to make but we will try to have different AI at different levels that can stick to our gameplay and give the player a great experience during the gameplay.

2.2 Case study of similar games review

Thief (2014 video game)

Image 1: Thief

Thief is a 3D stealth game that was developed by Eidos-Montréal and published by Square Enix in February 2014**.** Thief supported multiple video game platforms such as PlayStation3, PlayStation4, Xbox 360, Xbox One and also Microsoft Windows. "Thief" was the latest version of the game for the entire Thief series. The setting of the Thief is in a dark fantasy world that is inspired by Victorian, Gothic, and steampunk aesthetics.

The gameplay of this game is the player will play as a thief that needs to search and steal the good from the riches by using the ability of stealth and avoid being spotted by the guard or any non-playable character (NPC). The player was able to do lots of different things in the game as a thief like lockpicking, stealth in the house, hiding in the dark place that makes enemies unable to spot the player and parkour on the building. But, the main gameplay of the game is to stealth and avoid fighting.

Thief received mixed reviews, different sites of players giving different feedback and review for this game. According to video game review aggregator Metacritic. Most of the reviewers praised its stealth gameplay, level design, graphic and replay value, but they criticized

the map layout, technical issues, and the story of the game. But, based on the reviews from IGN, although the gameplay of this game is pretty nice, the main issues that cause this game drop the rating of the AI with certain problems of the game. The AI in this game are not smart enough and they will occasionally get stuck into the walls, but the good thing that developed did to this game is that the AI can notice the unconscious or dead bodies. But, the overall review describes that Thief has some strong stealth mechanics as a stealth game.

But, the AI in this game would not be applied in our project but references. The reason is that some of the AI functions are not suited for our project due to the different gameplay of the stealth game. In Thief, some of the AI functions do not fit our game such as detecting the unconscious body or dead body, because our project does not allow the player to attack the enemy or faint the enemies. Other than that, the AI in the Thief is following the patrolling system instead of having their perceptions compared to our game.

In our project, we tend to make the AI more human-like instead of programmed to follow the structure in the level. In conclusion, The Thief's AI is not that bad as a stealth game but the mechanic is not fit to our gameplay, but we do take the AI as a reference as a guideline for us to improve the AI in our game.

Chapter 3: System Specification & Requirements

3.1 Design structure of the game

The picture shown below is what and how we design the system transition for our project. We would be following the graph to make sure that our game sticks to the system like what we plan to do. Figure 2 is the Main menu function of what and where the player will go to.

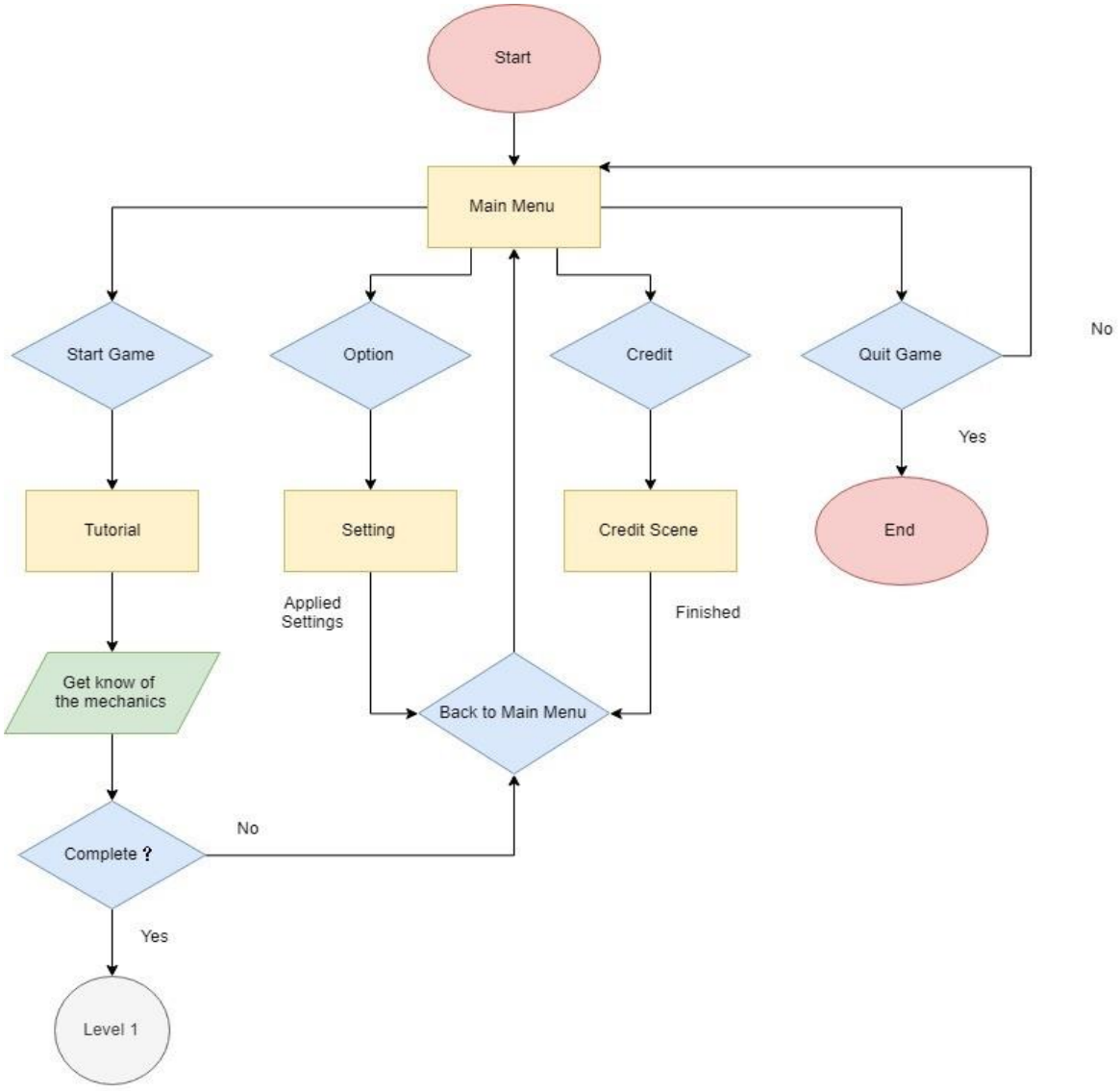


Figure 1: Design Structure 1

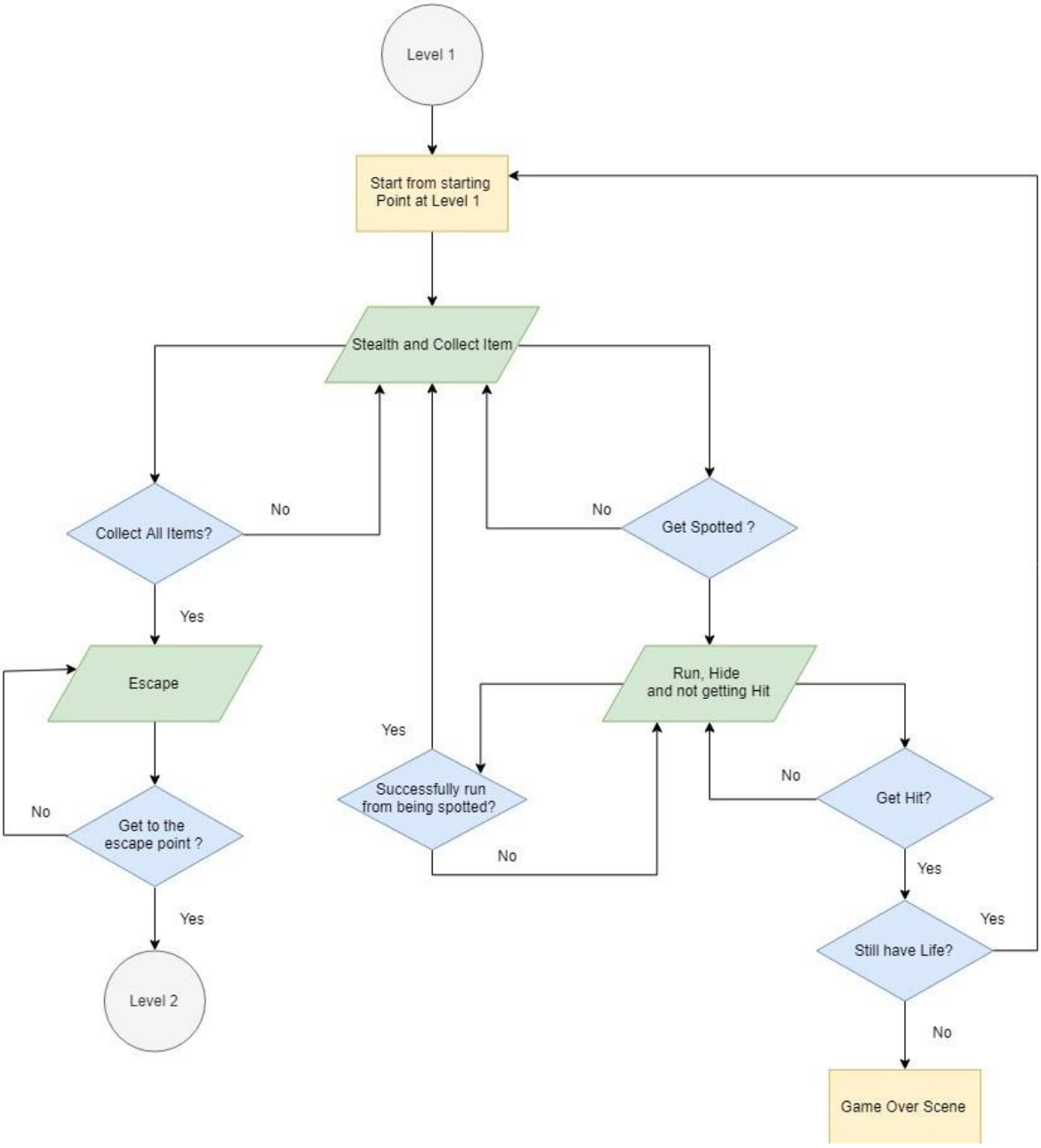


Figure 2: Design Structure 2

Figure 3 is the gameplay graph that will be used for the entire gameplay for our project. Although this graph is for level 1 but it can be used for the next level as well. The overall function is listed in this graph and we will follow the graph to program and design our game.

3.2 Design structure of AI

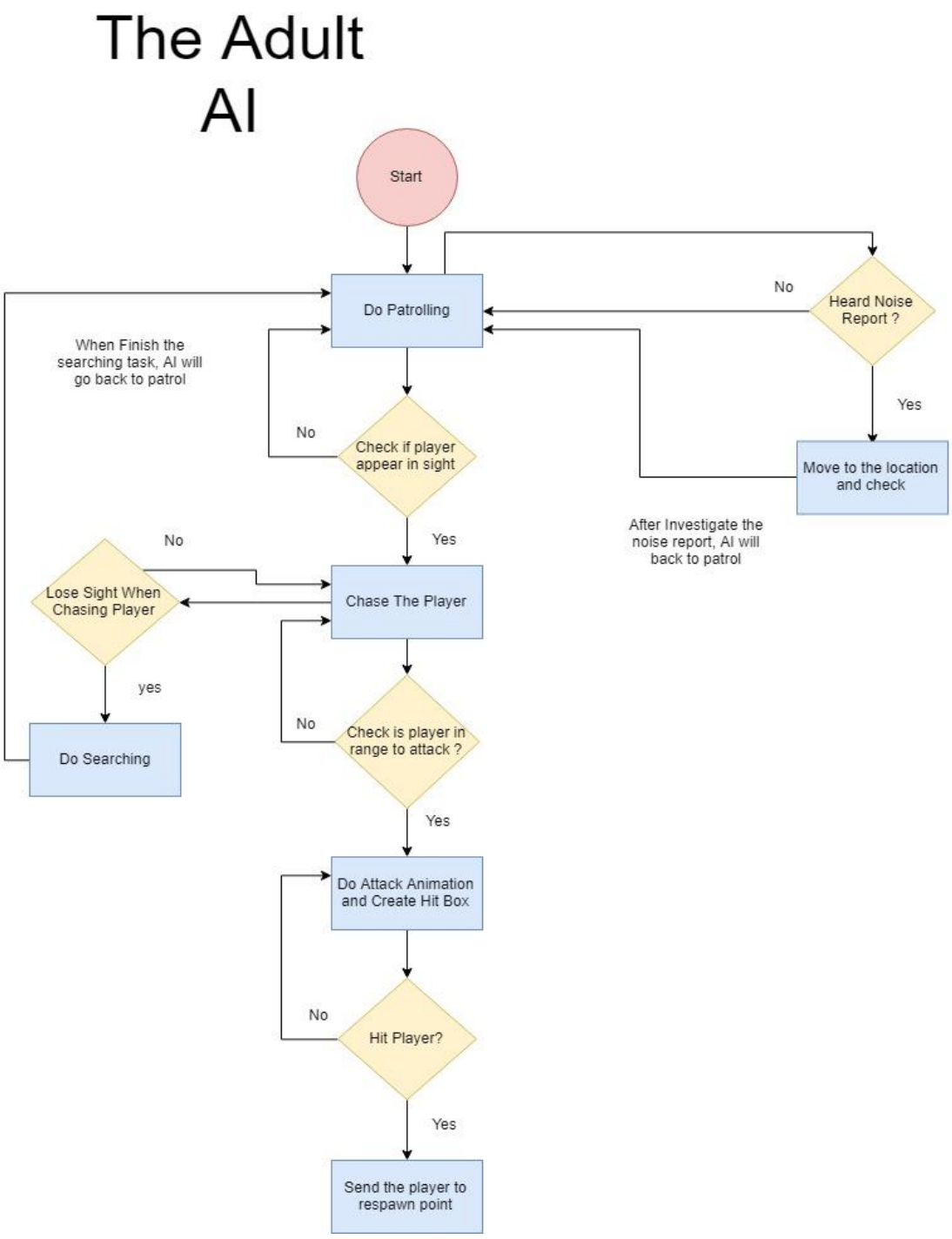


Figure 3: adult AI Chart

This is the behavior chart for the parents AI in the game. At the very first, the adult AI will patrol to the fixed point and always check the player. If the AI senses the player, then the

adult AI will chase toward the player and keep checking that it is in range to attack. After that, if the player was in the attack range then the AI will do the attack montage animation to control the upper body of the mesh to do the attack animation and create the hitbox from the hand socket.

Besides, the AI will do the attack animation then, the system will check that the hitbox hit the player. If yes, then the player camera will fade out and send the player back to the respawn point. However, if the player was successful to dodge the attack and escape from the adult AI's vision, then the AI will do the searching nodes to search for the player location randomly. The AI will patrol again if the AI did not find the player after searching.

Furthermore, our AI also will do the investigation when there are some noise reports to the AI. These noise reports can be reported by the player by using the whistles function to call the AI to search the player location or the player can throw some items in a certain direction to distract the AI to search on that location. The AI will change the status back to patrolling after the AI has done the investigation on that particulate noise report's location.

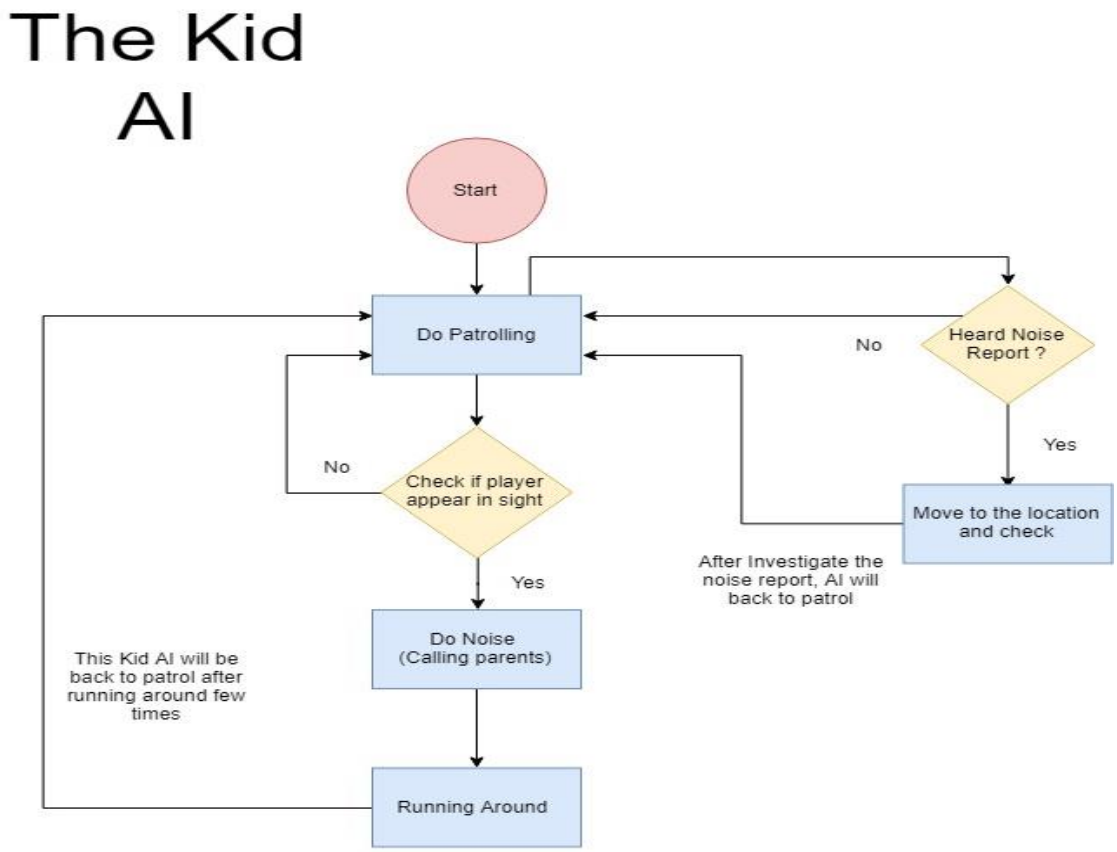


Figure 4: Kid AI Chart

Apart from that, we also have the kid AI for our game. The kid AI function is designed differently compared to the parents AI. In our game, we want our AI to be different and make it have different functions that can make our game even more interesting. After we discussed the kid AI, we spotted at some point that our Kid shouldn't hit the "Orang Minyak" based on the logic that, we set our kid will be scared off when he saw the "Orang Minyak".

In this Kid Chart, the kid will be patrolling when he doesn't see the "Orang Minyak". But, when the kid AI saw the "Orang Minyak", then the kid would do the scared off animation and scream or make a noise report for his parents to hear. If the adult AI was in range, then the adult AI will run toward the location and check for the child. After the kid is done screaming, and he will wait for a few seconds then go back to the patrolling state and do the patrolling.

3.3 Software & Hardware Requirements

Image 2: Unreal Engine

During the discussion with my group mates on which game engine we want to use for us to develop this project, all of us agreed to use the software entitled “Unreal Engine 4” from the Epic Game. The reason is that all of us were familiar with this game engine and this game engine has the advantages in doing this project such as creating good looking level design and environment, creating the game mood by the particle effect and plug-in lighting compared to other game engines.

Image 3: Illegear Laguna Model

The hardware for us to develop the project is based on the pre-laptop that we're using now. Although the laptop was bought 3 years ago, the functions and power of the laptops are still pretty strong for me to develop our Final Year Project " Struck by Oil".

The Manufacturer of my hardware is Illegear Sdn Bhd from Malaysia, and the laptop model is the Illegear Laguna. The specs of this model are using the Intel(R) Core(TM) i7-7700HQ CPU@2.80 GHz 2.81GHz processor and 16GB RAM. The system type of the model is a 64-bit Operating System, x64 based processor with NVIDIA GEFORCE GTX 1060 Ti graphics card.

Chapter 4: Design Implementation

As a programmer, I almost programmed everything for the game to make sure the game is working correctly. I covered every single detail and every part of the job with my team to ensure the game quality and telling them how things work to make our work proficiency.

4.1 AI Behaviors Tree

Behaviors Tree is an Unreal Blueprint Visual Scripting System for programmers in creating AI. There are 2 different behaviors trees for the AI which is the Adult AI and the Kid AI in our game. In the Behavior Tree, We can tell the AI what to do in what situation. An example of behavior trees illustrated below where an AI patrolling between point to point if they didn't see the player.

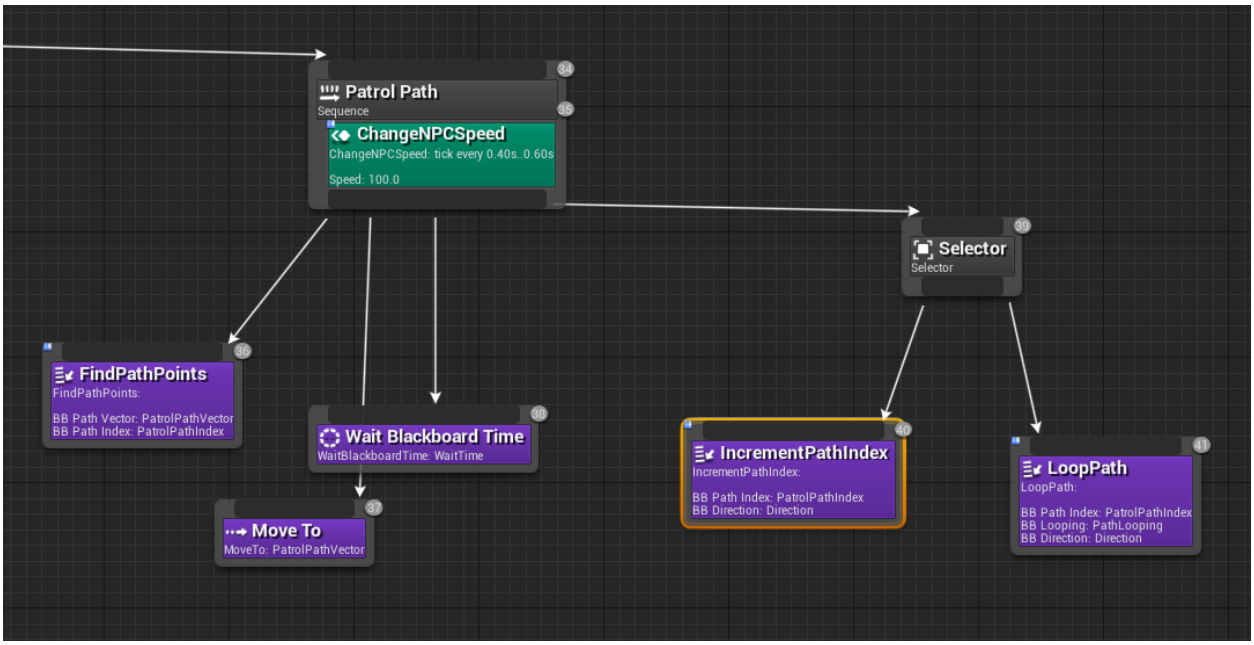
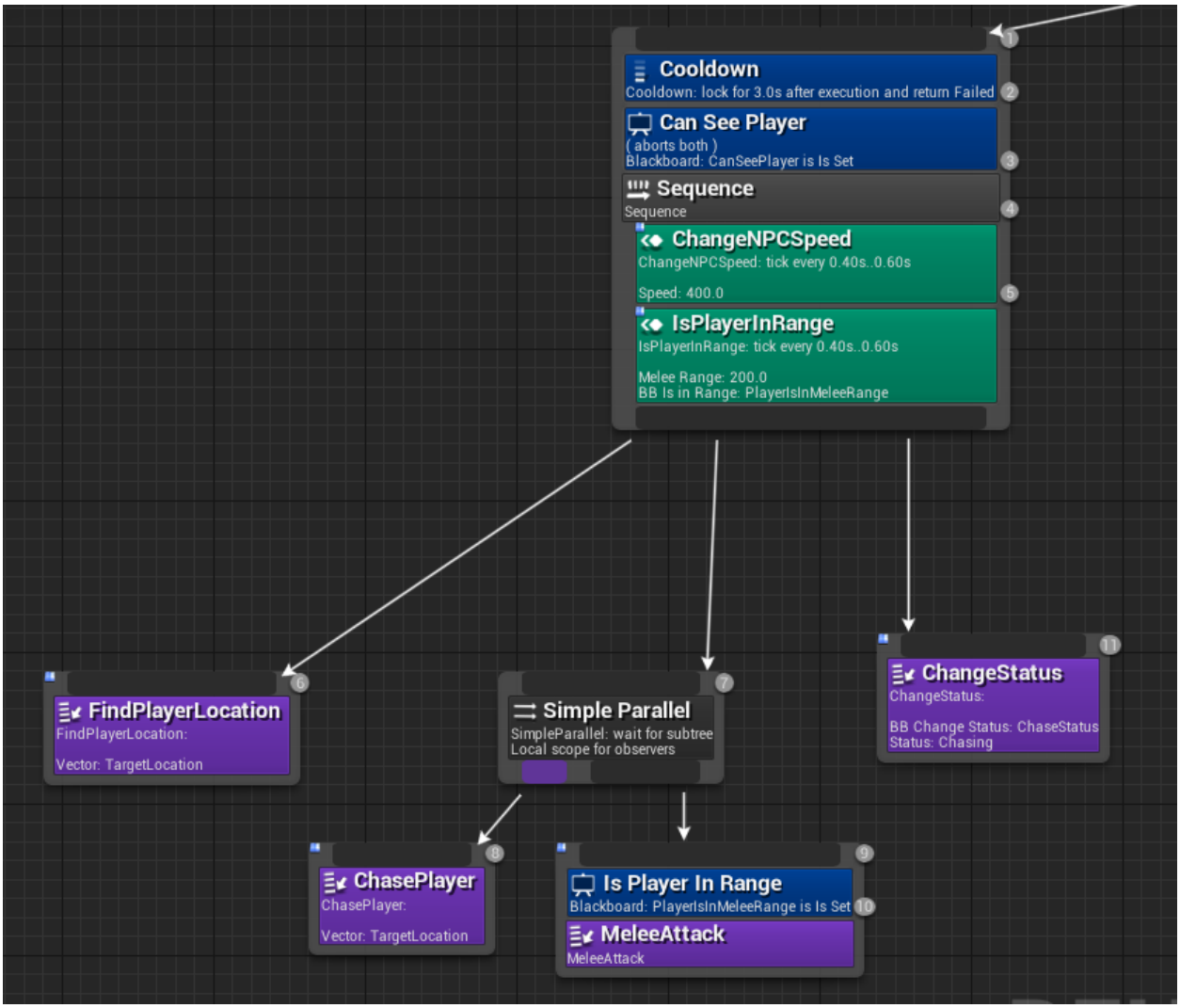


Image 4: AI Behavior Trees Patrolling Parts.

Both adult and kid AI were using the same patrolling parts as the picture shown in Image 4. But, the main mechanics for both AIs are different because we design the adult AI something that will chase and attack the player. When the adult AI sees the player character then it will chase after the player. The requirement of seeing the player character is that the visibility of the player must be more than 40% under the light then only the AI can see the player. The picture

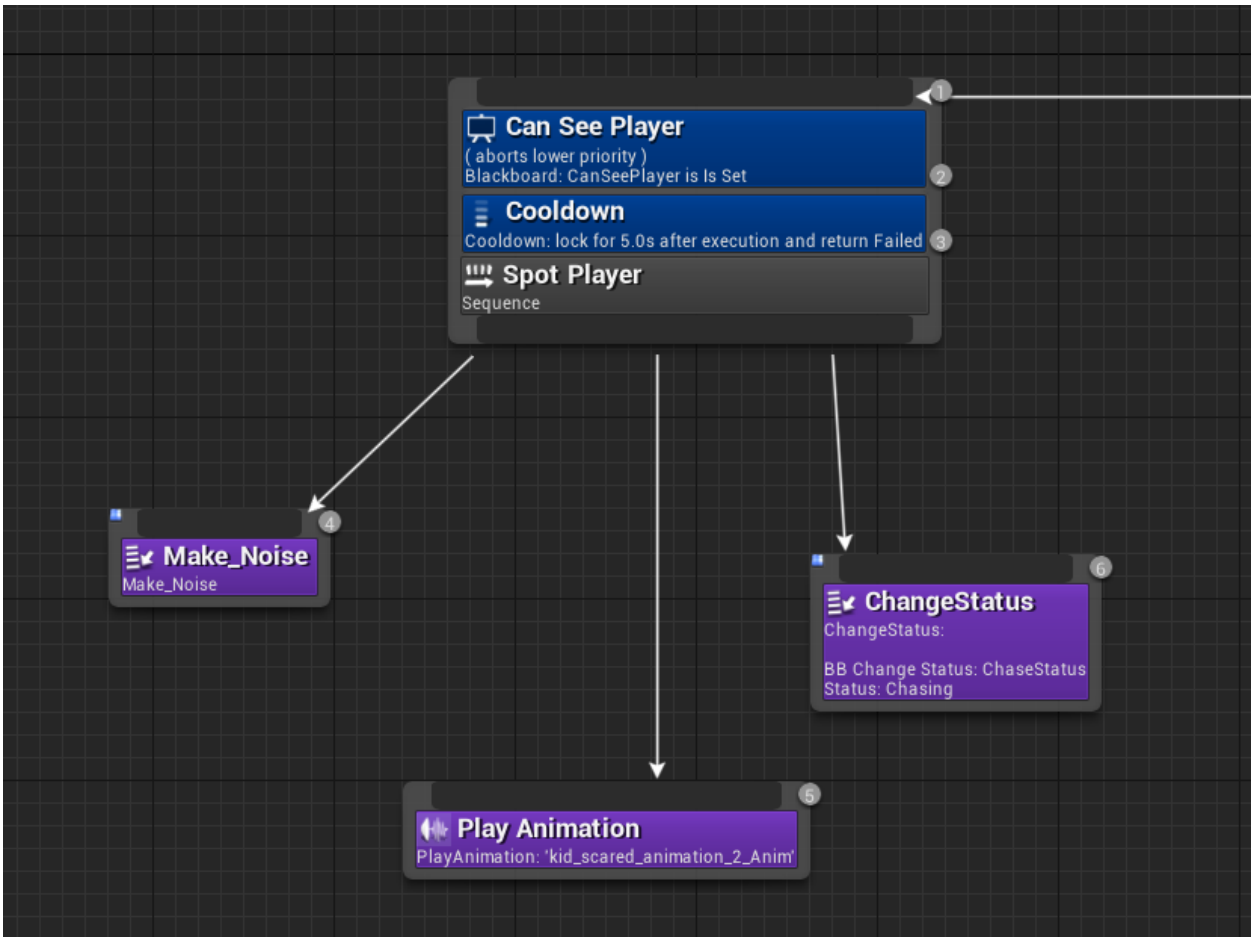
shown below is how I illustrated the AI to Chase the player and also to detect the player range between the AI himself.



Images 5: Adult AI's Behavior Trees Chasing Parts

The MeleeAttack shown in Image 5 is called when only the player is in range. The AI will automatically check the range between the ai himself and the player character in a certain range. The range I had set in the game is 250F vector range. If the Ai detected that the player is in the attack range (inside that 250F vector range) then the adult AI will do the attack animation and create the hitbox at the hand socket to detect whether they hit the player or not. If the Ai hits the player then the player will be sent back to the spawn point.

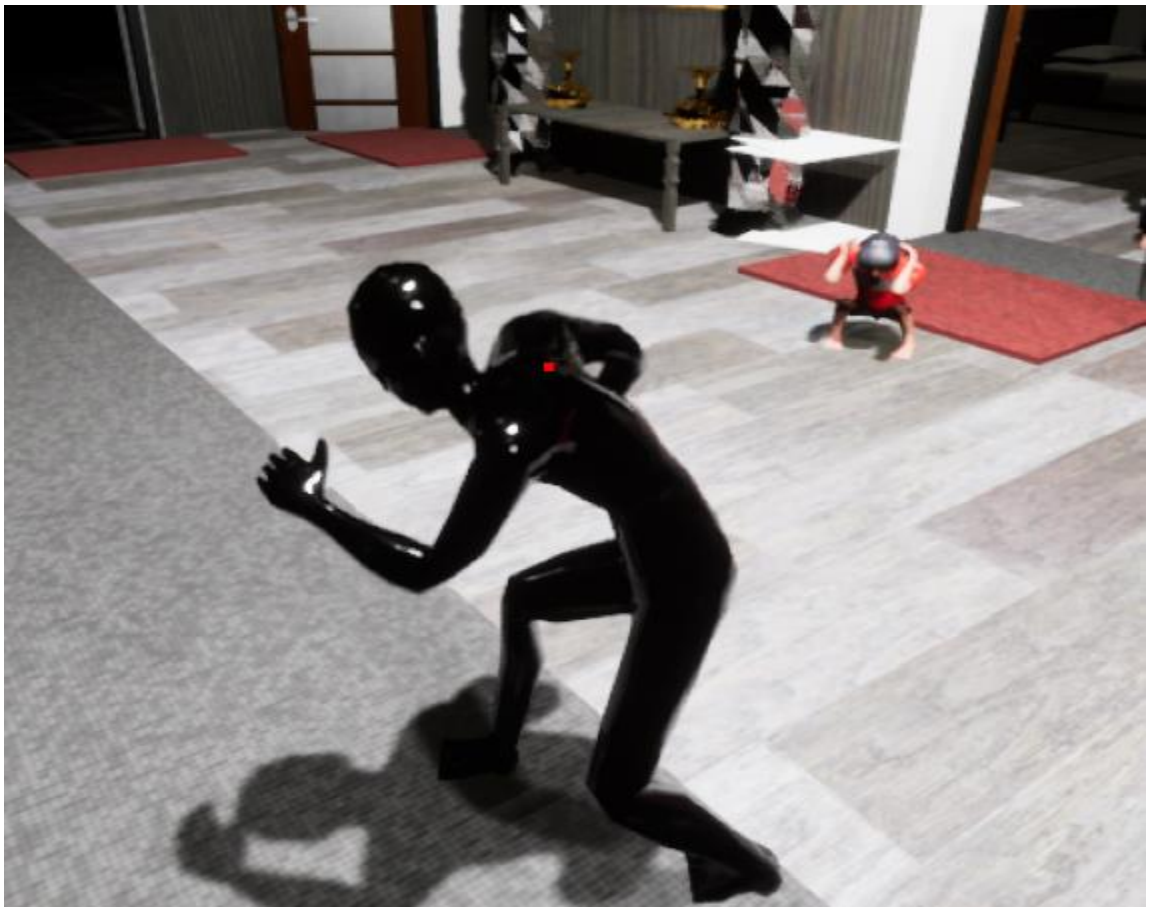
Besides, the AI will also do an investigation if AI hears the sound that is made from the player. The AI will simply move to the sound location and check. With this AI behavior, the player can use the item we placed inside the level to distract the enemy (AI) to help the player to steal things safely.



Images 6: Kid AI behaviors tree see the player part.

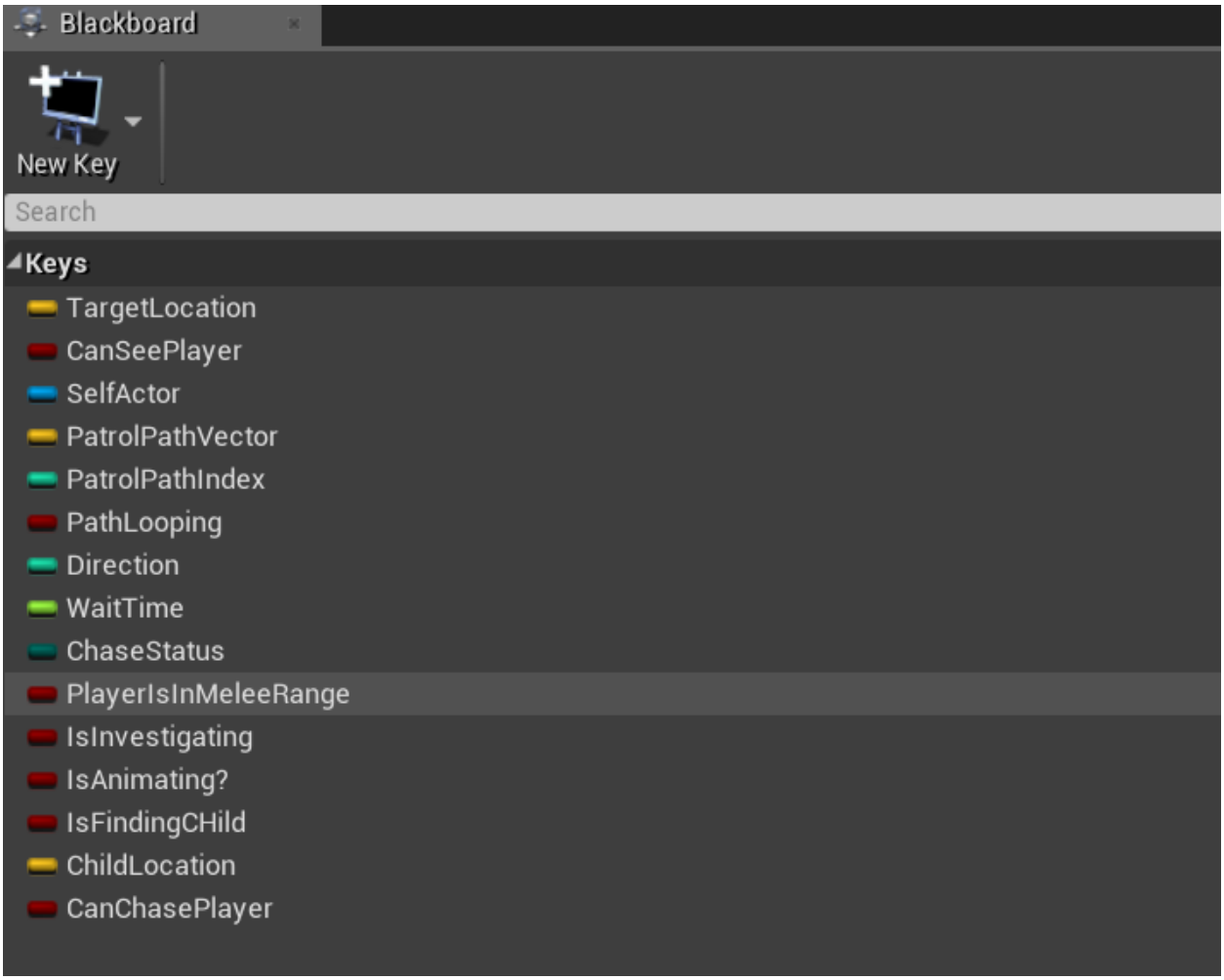
Other than that, the kid AI also does the same things like patrolling and investigation except the chasing and attacking parts. The reason is we don't think that a kid was courageous and strong enough to fight with mystical creatures. So, we amend the kid AI's behaviors to look like a kid as a picture that we showed below which the kid AI will hold his head down and ask for help. If the parent (Adult AI) hears that their kid is crying or screaming then they will directly rush to their child to check what happened to their kids. If the parent (adult AI) sees the player

character before they reach the kid's location, then the AI will directly chase after the player instead of searching for their kids.



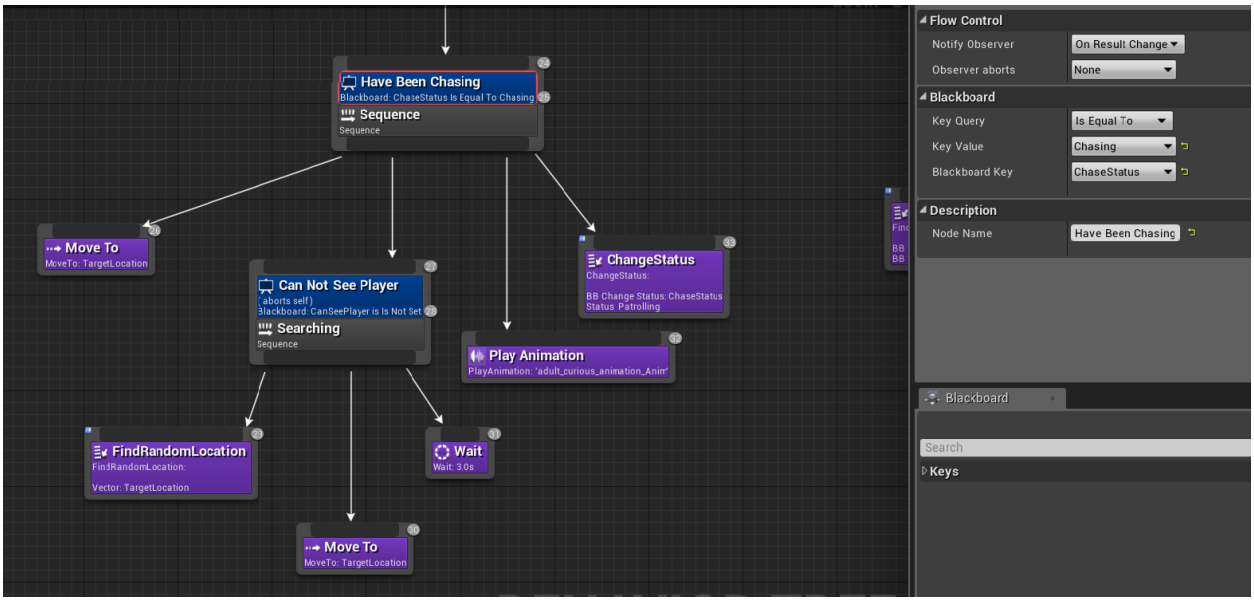
Images 7: Kid AI’s Screaming behaviors

4.2 Black Board Value



Images 8: BlackBoard Keys

BlackBoard Keys is a value is like an order that can be called or changed by a certain situation to affect the AI behavior tree and the results outcome of the AI. To tell the AI what to do next or now is based on the BlackBoard Keys and set or is not set in the blackboard decorator.

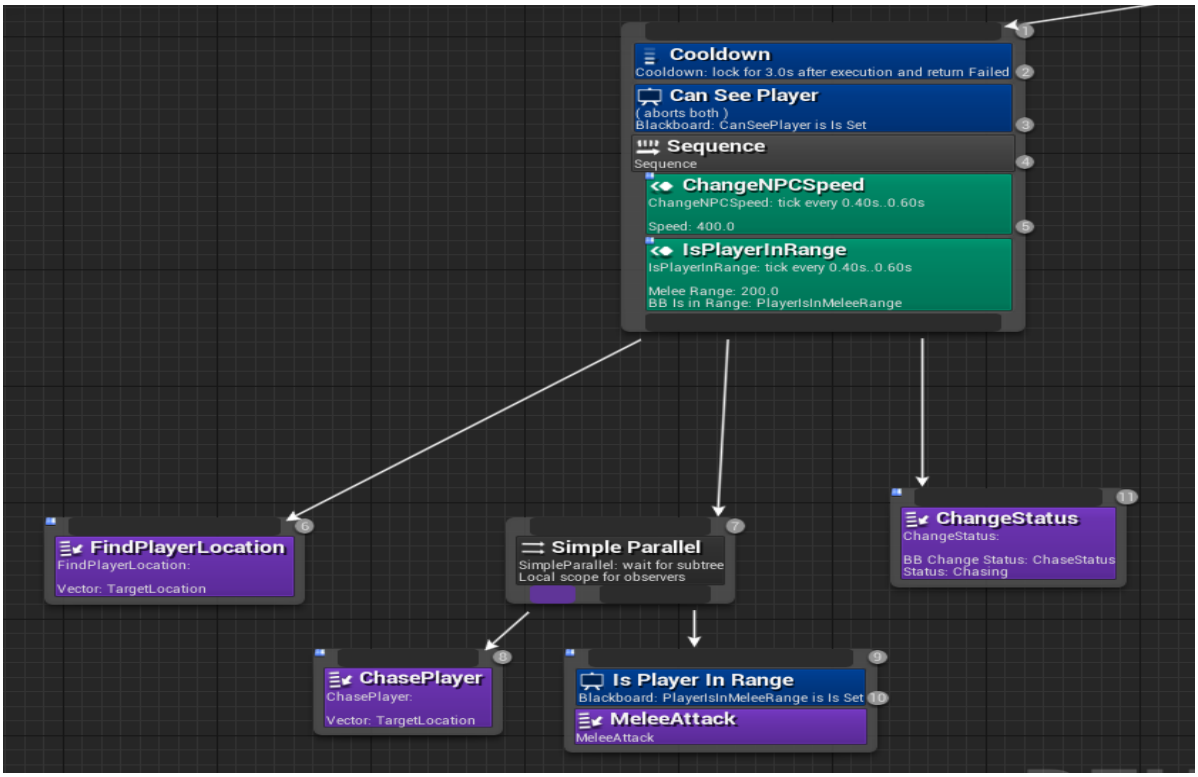


Images 9: BlackBoard Decorator

Based on the images 9, we can see those blue color nodes are a blackboard decorator that need to set a value to trigger the AI to run the function under the arrow. Take Images 9 as an example, if the AI has been chasing which means that the AI is in chasing state then it will keep moving to the target location (player location).

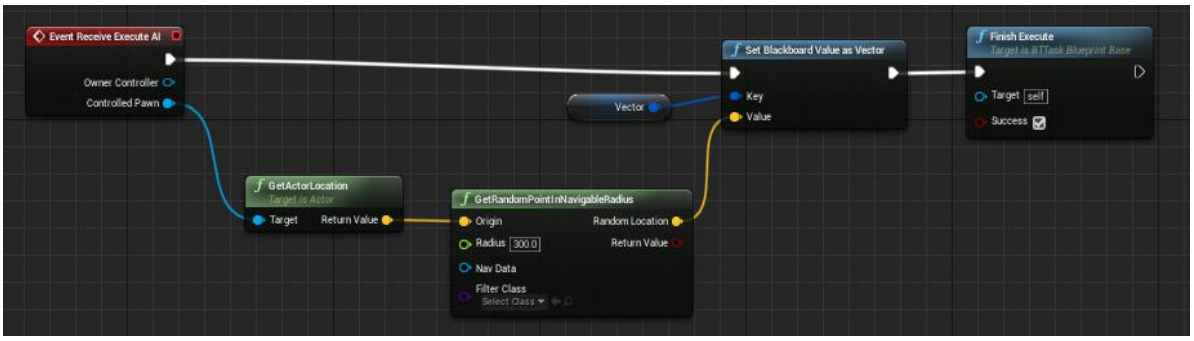
During this decorator, once the player character escapes the AI sight, then the blackboard decorator “Can Not See Player” will be activated. Then only the AI will run the function under the “Searching” sequence such as “Find Random Location”, “Move to target location”, and “Wait”. Once the AI finishes the “Searching” sequence, then it will go to the next node, which is the Play animation node and also the Change Status node after the animation is done.

4.3 AI Task & Services



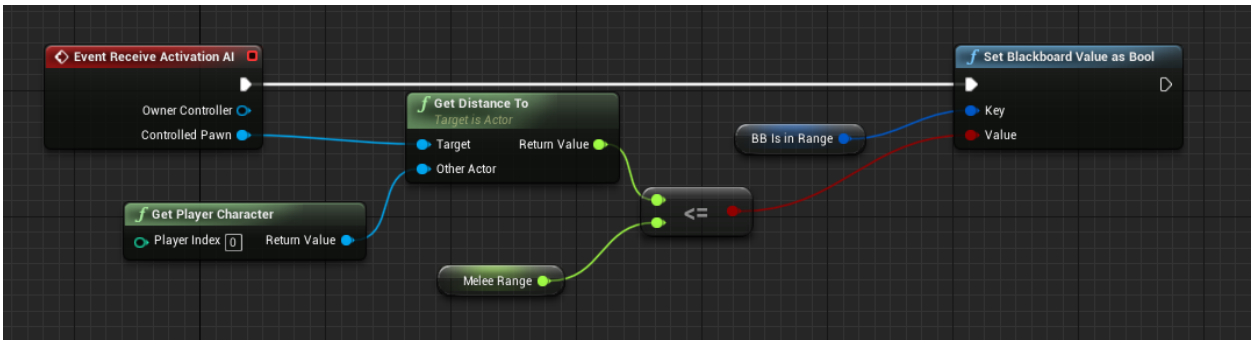
Images 11: Task & Services

The task and service nodes are very important to the AI behavior trees. In an easy way to say, the blue nodes are what allows the AI to do, then the task (purple nodes) is what AI will be doing. For example, blue nodes telling the AI now you can chase, then the purple nodes is a code that makes the AI chase toward the player.



Images 12: Behavior Trees Task Code

Inside the task was a group or code that code for a certain action. Every task has a function that can be used or called in behavior trees. Once the AI runs through all the code nodes then finally come to the Finish Execute nodes which tells the system that this AI has finished this task that is assigned in the behavior trees and this AI can proceed to the next task or next nodes inside the behavior trees.



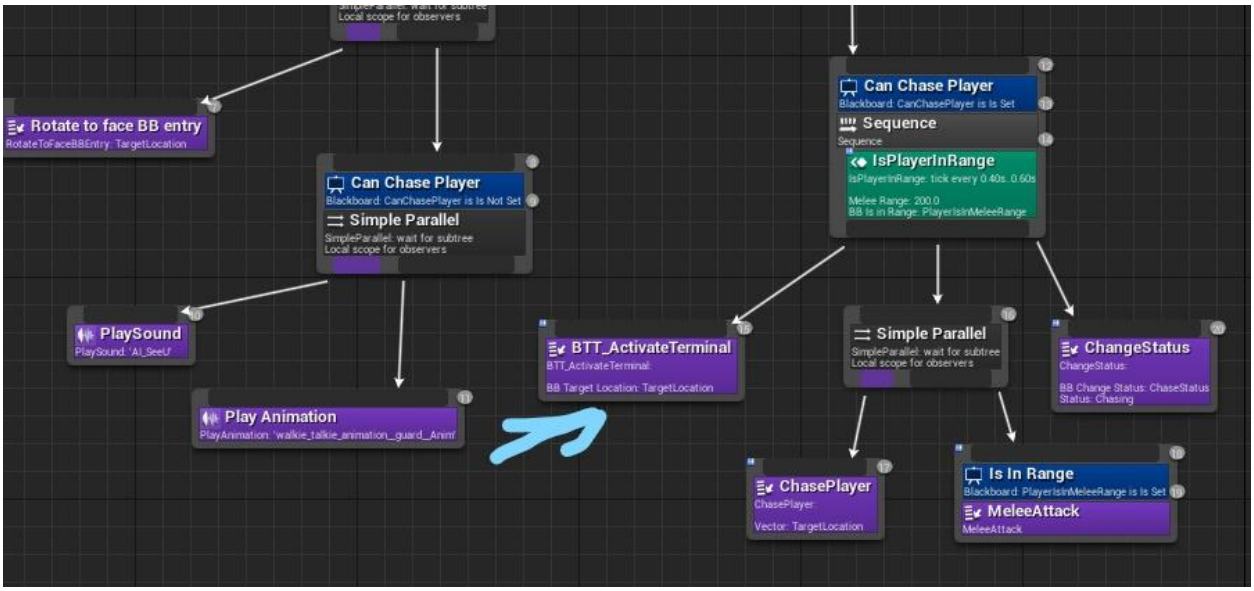
Images 13: Services Nodes Codes

Other than that, the difference between the task and services is just that the services are something then tick every second or certain time frame which means that this function will always be checked or checked after a certain time. Moreover, use Images 11 as an example, the task can only be called when the blackboard decorator is set to allow the system to call. And it only runs once if the system is not calling it again.

But, the service nodes (Green nodes) is a service task that keeps ticking the function. Services Task (Green nodes) mostly used for something that always needs to be checked. So, I used the services nodes for the AI to check the player range to call the “MeleeAttack” node in this project.

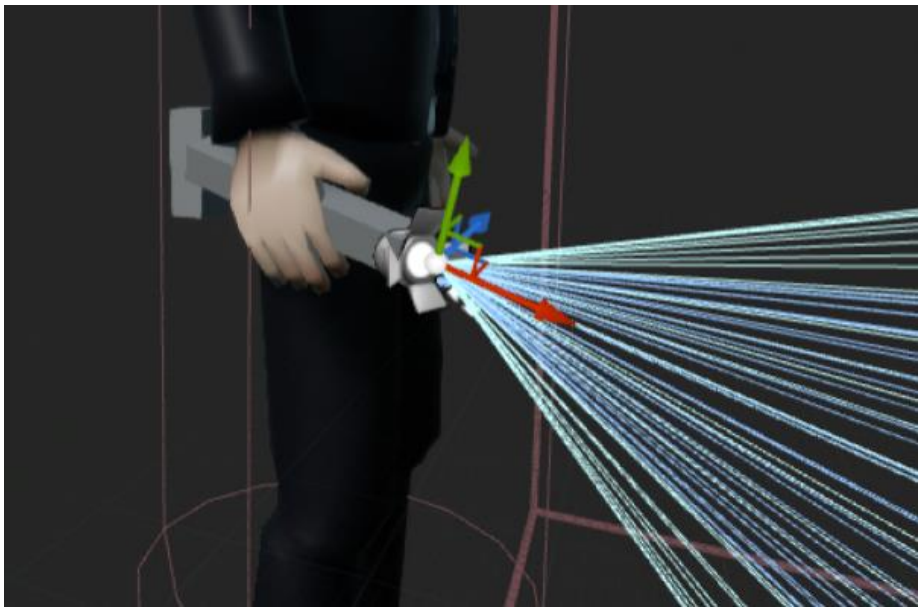
Images 14: Guard AI NPC references

Furthermore, I did implement new ai behaviors in Level 3 due to the level design. This AI was called a Guard AI. the guard AI behavior is almost the same with the normal AI just there something different which is the guard will activate the lockdown system and talk with the walkie-talkie with some humor sound effect once the guard AI saw the player



Images 15: Guard AI Behavior Trees

Based on the images 15, we can see that once the AI has done the animation then it will run the “BTT_ActivateTerminal” nodes which control the AI run to the terminal and trigger or activate the lockdown system inside the level and ring the alarm. When the lockdown system is being activated, some of the areas will be blocked by the steel door until the AI deactivates the lockdown system.



Images 16: torch on the guard hand.

Besides, this guard AI hand is having a torchlight allow the guard to see the player even though the player is hiding inside the dark places. The reason to do this is to increase the difficulty of the level and also force the player to keep changing the hide location unlike the level 1 and level 2 where there is always a safe place for the player to hide.

Images 17: Steal items from the AI.

Lastly, we also implement some items there on the AI body that the player needs to steal such as a door key. The player is not able to open some door if the player didn't manage to steal the key from the AI but if the AI passes through the door then the AI can open the door. The funny thing happened here is that the player can choose to follow at the back of the AI instead of stealing the key to open the door. This function made the gameplay even more flexible due to the player decisions.

Chapter 5: Result and Evaluation

In this chapter, I'll be talking about AI function, Player function, the level, programming problems such as bugs and some unreal engine issues that wouldn't be fixed. In the early stages of the development, we asked our classmate and our housemate to test our game to obtain feedback from the players.

5.1 Testing

For the testing part, for our **level 1** design, there are some lighting problems that still need to be amended because the lighting looks too dark and the player can't even see where the dark places for the player to hide. Besides the lighting, the items that the player needs to collect also need to be replaced due to some items location is too hard to find, and the player has no time to find due to the AI keep chasing the player like crazy.

Besides, for **level 2** of the game can be considered as done. We haven't found any member to test our level 2 out yet but, as a game tester or a game programmer, we did test out level 2 and it is playable and even more fun and playful than the level 1. At the early stage of the test play, our tester told us that the kid AI at **level 2** is a bit useless because the AI parent's hearing senses are too short to hear the kid cry when the kid AI sees the player. This is the reason that makes the kid AI feel so useless.

Based on this problem, then we enhanced all of our AI senses which is the AI sight sense and also the hearing senses to make sure the AI can cooperate with other AI components, and also to make the game feel challenging and playful for the player.

However, we did test different versions of AI for **level 3**. Then, we found out there is a guard AI that feels stronger than others guard AI. But then the main problem is that all guard AI is using the same data as their AI perception. Other than that, we also feel that **level 3** is a bit too hard to play for the player but the level is still playable. Other test players mentioned that level 3 is very challenging to play but they still managed to finish the level.

5.2 Bugs

As a programmer of the team, I am facing some of the bugs that appeared in unknown conditions that were not able to get fixed. Maybe I am not that skillful to fix the bug and some of the bugs will suddenly appear in random times such as the AI not moving after changing into a new level. This bug is caused by the unreal engine and We face this problem at the consultation sometimes. All settings inside the game were fine but the AI is not moving because we need to restart the game to solve the problem.

Besides, in Level 2 if the player opens the door placed at the 2nd floor of the master room, the player will be pushed downwards on the level, meaning that the player will fall into the 1st floor and sometimes the player will be stuck inside the gate but the player can use a jump to solve the stuck problem.

However, there is some collision problem for the props that will make the player stuck inside. Those items that will make the player stuck inside are cloth stands that we placed in level 1 and level 2 and also the trees we placed at level 2 and level 3 that will make the player stuck inside those sticks on the trees.

Other than that, these bugs only appeared in the AI, which is the guard AI sometimes will play the sound effect twice when he sees the player character. Other than that, the AI will block each other if they are walking the same path, and also when AI passes through the door and sees the player, AI will be stuck inside the door.

5.3 Issues and constraints and Troubleshooting

The issue I am faced with is the unreal engine's particle effect will crash the engine and force shut down. These issues made me unable to progress an important mechanic for our game which is the "Minyak Senses". Luckily, I do have a backup file for me to do the "Minyak Senses" but the price is I need to redo brunch of progress that I had done for a week ago.

Besides, the camera auto exposure makes us use too many times to change the lighting and this causes the player and even the game file itself to take time to adapt the lighting. But, at the end of development stages, I fixed the problem that caused the light exposure and this helped in our level development.

However, we also faced that the level 3 AI conflicted with the parent AI which affected the "Minyak senses" of the "Orang Minyak". This will make the Minyak Senses keep flickering due to 2 different AIs running at the same time and both AIs are affected by the value that is set for the spider senses.

Other than that, we also face some issues where the AI cannot hit the player when the player location is near with other props. The reason for this issue is that the hitbox that spawned from the AI is not casting multitracking. So, when the hitbox hits 2 the player with another object at the same time then the program is not able to call the function when the player gets hit. These issues make me want to redo the whole hitbox program for all the AI.

Chapter 6: Future Work & Conclusion

As a programmer, I wish to improve the function of the game and fix all the bugs to make sure the game can work pretty well and I would like to give some little detail in making more realistic AI that can fit our game very well. But, we ended up giving up on those little detailed things in the game just because we need to follow the schedule and we have no enough time to do it.

Due to the MCO, we hardly to discuss our idea between our group member and express our idea and opinion in some details of the work and we feel very difficult on combining our work together because some of the group members are living at the villager with slow wifi, every time we need to download the file that our group members had done that need to take a lots of time to download and sometimes the download will fail and you need to download again.

Other than that, I would like to implement currency into the game for the player to buy skill, character model or emote, and some funny costume for the character for my future works. The player can obtain the “oil coin” in different ways. For example, the player can get some oil coins at the end of the winning screen based on the time that player used to complete the level, the faster the player completes the level, the more oil coin the player can earn.

Besides, with or without getting hit from the enemy can have extra coins as a reward for the player. Once the player has enough money, then the player can open up the shop menus to choose what they want to buy. Players can buy skills for the “Orang Minyak” to increase the gameplay of the game or can help the player to solve the game even more easily. Moreover, the player can also buy the funny emote that the “Orang Minyak” can do in the level just like “Fortnite emote” or to buy a different pattern of “Orang Minyak” and also customize the “Orang Minyak” character based on the player’s taste.

6.1 Conclusion

Although we're facing lots of problems like MCO and COVID-19 epidemic when we're developing the game "Orang Minyak", I had put all of my efforts into it, no matter how great or the bad of the game is, for me "Orang Minyak" would be the best game that takes part in my life that I had developed, and I do learn more about the programming on games, and AI itself. It's impossible to program a perfect AI for the game but to program an AI that can fit the gameplay is pretty fun to me and I did learn and expand a lot of programming skills in how to make things proficiency, and how to modify the programming in another simple way when I was developing the game "Orang Minyak".

In conclusion, "Orang Minyak" might not be perfect but I do enjoy the development with my teammates and I learn how important teamwork between group members is in developing a game and I did improve and enhance my programming skill and know more about the Unreal Engine.

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Project Paper Consultation Logbook

Project Title	**Struck By Oil**
Student Name	**On Jia Hao**
Student ID	**1603907**
Year/Semester	**Y3S2**
Supervisor	**DR. Aloysius Yapp** **Mr. Ng Boon Yew**

WEEK 01

Comments: - **Come up with 2 ideas of game proposal** - **Research topic & question and it must related the game idea**	**Supervisor signature:**

Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **16/10/19**
WEEK 02	
Comments: - **Instead of dark environment (mood), Use the word "noir". – noir mood.** - **USP (Unique Selling Points) need to explain clearly and more details.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **23/10/19**
WEEK 03	

Comments: - **Done: AI searching, AI patrolling, AI Chasing Player, AI sight perception,** - **Need to do: AI sound perception, player function like crouch, interactable item, throw item and let the player can hide inside the noir environment**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **30/12/19**
WEEK 04	
Comments: - **Lighting have to be more programming.** - **Energy Sensed light for level** - **Different type of AI like; guard, dog, some will search, some will investigation, dog or CCTV.** - **Finish the hold & throw function**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5	**Date:** **6/11/19**

Poor Satisfactory Good	
WEEK 05	
Comments: - **Need to finish lot of function** - **Camera Angle need to fix** - **Gameplay function**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **13/11/19**
WEEK 06	

Comments: - **Lighting. Make sure projector can show** - **Apply all texture & sound effect for level 1** - **Destructive mesh if got time.** - **Chapter add AI chart Flow in documentation.** - **Particle effect & possess volume.** - **Create something like time attack.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **20/11/19**
WEEK 07	
Comments: - **Lighting need to be improved** - **Another character (Female orang minyak maybe)** - **After the player finish the level, need to think about the replay value** - **Tutorial only run once** - **Save Game + other elements**	**Supervisor signature:**

Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:** **27/11/19**

Project Paper Consultation Logbook

Project Title	**Struck By Oil**
Student Name	**On Jia Hao**
Student ID	**1603907**
Year/Semester	**Y3S3**
Supervisor	**DR. Aloysius Yapp** **Mr. Soh Wuu Shyong** **Mr. Ng Boon Yew**

WEEK 01

Comments: - **Fix some parts of the level.** - **Make objects more attractive.** - **Level Visual.** - **Tutorial runs once (Save File).**	**Supervisor signature:**

Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 15/1/2020**
WEEK 02	
Comments: - **Red cursor makes it bigger.** - **Put proper sound.** - **Npc broken (eyes on behind)** - **Reset the spawn point when the player loses life.** - **Highlight for items not obvious.** - **Highlight won't disappear when players walk away.** - **Show highlights when players are near to interactable object.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 22/1/2020**
WEEK 03	

Comments: - **NO consultation Due to CNY**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 29/1/2020**
WEEK 04	
Comments: - **Let the player can skip the cutscene in tutorial** - **Fix AI Loop Path problem** - **Drop the item in hand when the player get hits** - **Fix the AI vision & hearing setting**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5	**Date: 5/2/2020**

Poor Satisfactory Good	
WEEK 05	
Comments: - **Make something similar like spider senses for AI or players.** - **Let players have time & know the AI is looking at the player.** - **Implemented the switch on/ off light function** - **FYP report chapter 4**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 12/2/2020**
WEEK 06	

Comments: - **Save Game Functions** - **Win Scene** - **LV2 AI done.** - **Created timer for speed run, and recording the players faster record in completing a level.** - **Level Selection Scene function done.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 19/2/2020**
WEEK 07	
Comments: - **AI Nav Mesh problem. (Causing the AI no Moving in the level)** - **The Safe Zone for level 1 needs to be increased.** - **The lighting in Level is so confused where it is safe and where the AI can see the player.**	**Supervisor signature:**

Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 26/2/2020**
WEEK 08	
Comments: - **Finish the level 2 (next week)** - **Main menu Animation done.** - **UI font need to change** - **Fix the player see through the wall** - **Implemented the AI in doing some event** - **Now showing highlight to other object like door**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 4/3/2020**
WEEK 09	

Comments: - **Lighting for safe place not so obvious** - **The light need to change / fix** - **Players hide in dark places but the AI still can see the player.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date: 11/3/2020**
WEEK 10	
Comments: - **AI can see through walls** - **AI too sensitive** - **Level 1 cannot end game** - **Save record for level 3 go to level 1** - **What player can do must be telling in the tutorial**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5	**Date:**

Poor Satisfactory Good	
WEEK 11	
Comments: - **Some action overlays when the kid is making the noise, cause AI chasing the player but facing a different direction.** - **The Minyak Senses keep flicking in level 3.** - **The camera affect the player visibility** - **Some level have not been texturing**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**
WEEK 12	

Comments: - **Everything Fixed for week 11s** - **Alarm too long and the guard AI sucks.** - **Lighting need to improve** - **Mission UI needs to be fixed. Image not being in the center** - **NPC animation renew** - **Someroom still too dark** - **Collision problem with cloth stand, trees, and gate** - **The guard can see through the wall after the lockdown.**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**
WEEK 13	
Comments: - **Pick up item for level 3 got problems which the player can pick up at 3rd floor from the 2nd floor.** - **Polished AI behaviors & enhanced the AI.** - **Reimport some item for the holding item to solved the item is not holding in the player hands** - **Use the emissive light for those dark room to rise the visibility for the level**	**Supervisor signature:**

Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**
WEEK 14	
Comments: - **Added another images for Minyak senses at the tutorial for telling the player the function of the minyak senses.** - **Fixed level 1 lighting inconsistent** - **Fix almost everything**	**Supervisor signature:**
Progress (please circle the feedback) 1 2 3 4 5 Poor Satisfactory Good	**Date:**

Appendix E

Final Project Title Form

Fill in the information below as detailed as you can after confirming project title.

Project Type:

Product Based Project

Research Based Project

(tick the appropriate box)

Student ID	Student Name	Email & Contact no
1506597	Yap Hong Jian	Jerryyap9417@gmail.com 017-2589417
1605551	Paul Yap Lin Xiao	Mokoutan98@gmail.com 016-3319805
1603907	On Jia Hao	Skyhao97@gmail.com 016-6996296

Supervisor: Dr. Aloysius Yapp, Mr Ng Ben Yew, Mr Soh Wuu Shyong

Project Title: Struck By Oil

Project description:
Struck by Oil is a stealth game that player have to complete all the mission of each level. Players need to use the environmental advantages in order to steal all target object safely and not be discovered by enemies.

Student name	Individual Project Scope
Yap Hong Jian	- Animation - Character Design - UI - Promotion Materials (Game poster, teaser, concept board, name card)
Paul Yeap Lin Xiao	- Level Design - Assets modeling - Lighting - UI
On Jia Hao	- Programming