

CSCI 522 – Game Engine - Fall 2024 - HW 2

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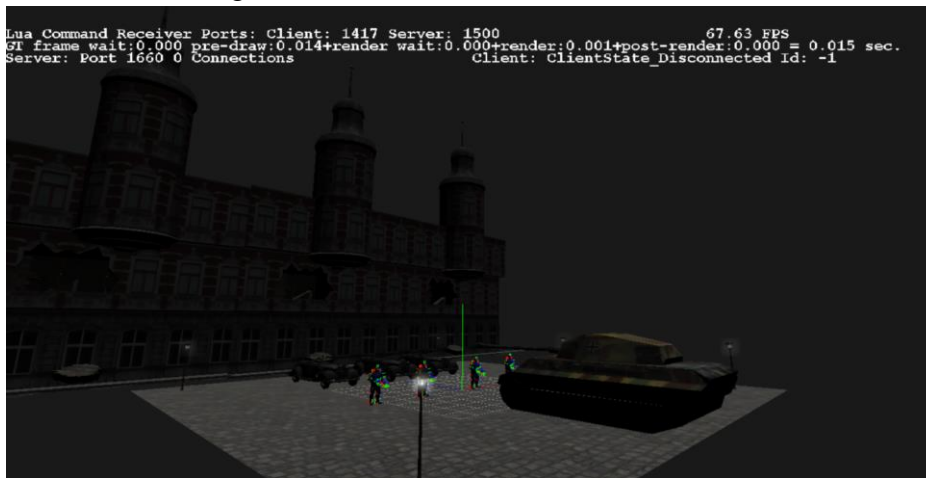
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Here are the tutorials

1) T0 Building levels :

Building custom levels in maya using the PE engine default components. Building simple test scenes to experiment with different settings and configurations.

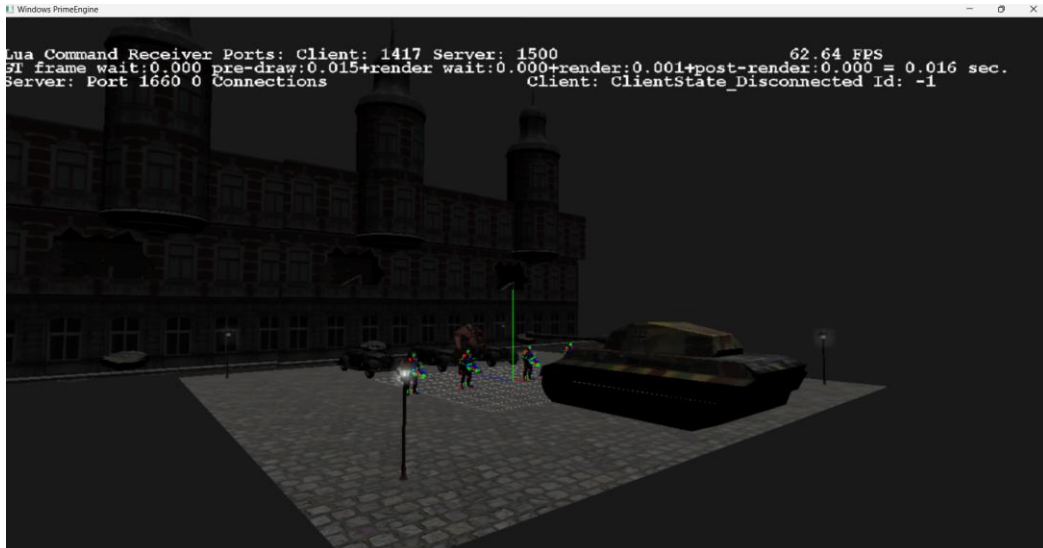
This is made using the level builder.



2) T1 Adding custom objects:

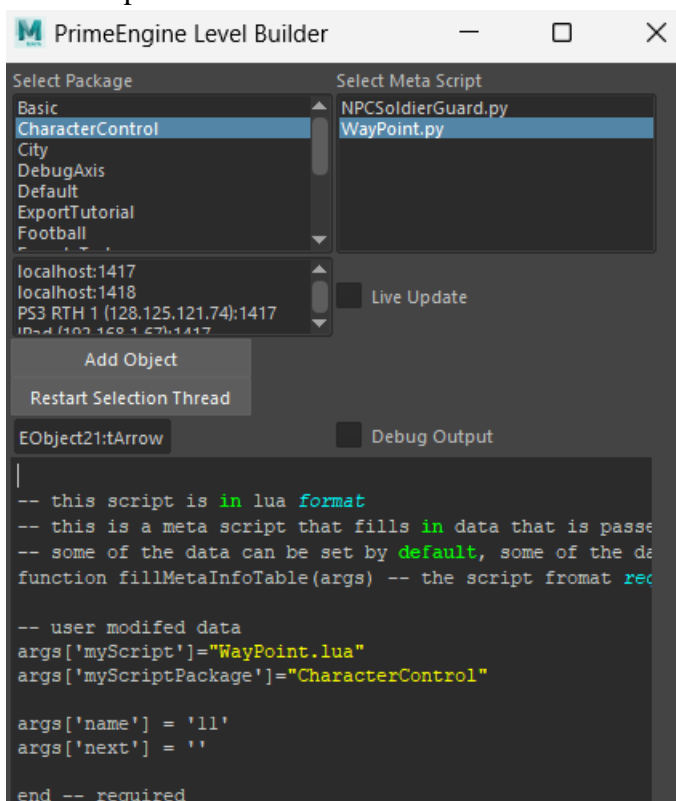
Designing custom objects using a 3D modeling software like Maya. Using the engine's import tools to bring custom objects into the project. Here I have added imrod to my previously created test level. Create a script with respect to the requirement.

```
C: > projects > PEWorkspace > AssetsOut > CharacterControl > GameObjectMetaScripts >
1  t = {}
2  t["mayaRep"] = "Maya/Meshes/Imrod/ImrodRep.ma"
3
4  t["callerScript"] = ''
5  -- this script is in lua format
6  -- this is a meta script that fills in data that is passed to '
7  -- some of the data can be set by default, some of the data mig
8  function fillMetaInfoTable(args) -- the script fromat requires
9
10 -- user modified data
11 args['myScript']="SoldierNPC.lua"
12 args['myScriptPackage']="CharacterControl"
13
14 args['skinName'] = "imrod.x_imrodmesh_mesh.mesha"
15 args['skinPackage'] = "Default"
16
17 args['gunMeshName'] = "m98.x_m98main_mesh.mesha"
18 args['gunMeshPackage'] = "CharacterControl"
19 |
20 args['npcType'] = 'Enemy'
21 args['patrolWayPoint'] = ''
22
23 end -- required
24 '''
25
```



3) T2 CharacterControl overview:

Waypoint are specific points in a game environment that characters or entities can navigate to. Added additional waypoints to the level to make the character move in different path.



4) T3 CharacterControl engineering overview:

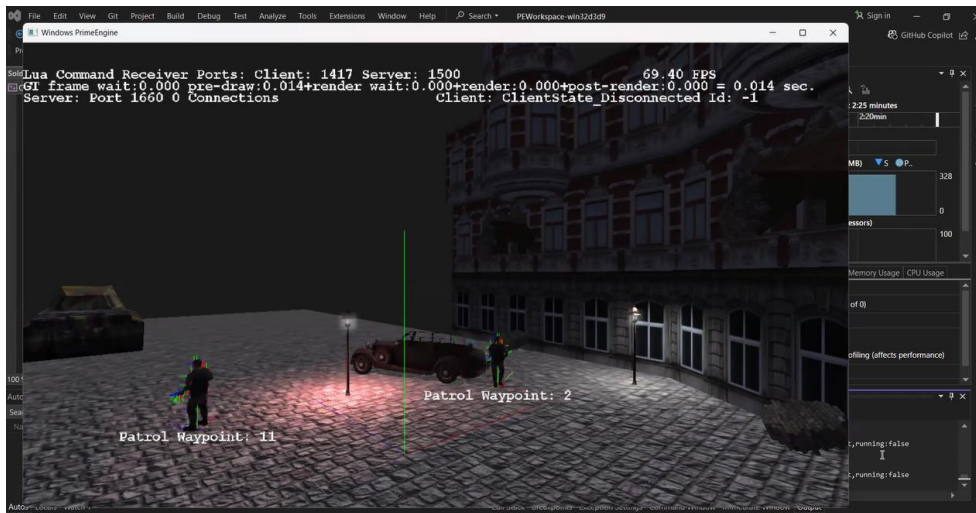
This step explained about how the PE events work. It gives a clear understanding of the function calls and how the data flows within the events.

5) T4 Modifying existing events:

Modifying existing events in a game engine to make a character walk at random speeds.

SoldierNPCMovementSM.cpp

In do_UPDATE Change the speed value.



6) T5 Adding new events:

Modifying existing events in a game engine to make a character walk & run at random speeds.

SoldierNPCAnimationSM.cpp

Add do_SoldierNPCAnimSM_Event_RUN

Add event to addDefaultComponents

SoldierNPCAnimationSM.h

Add event handler for RUN

GlobalRegistry.cpp

Add Function for RUN

SoldierNPCMovementSM.cpp

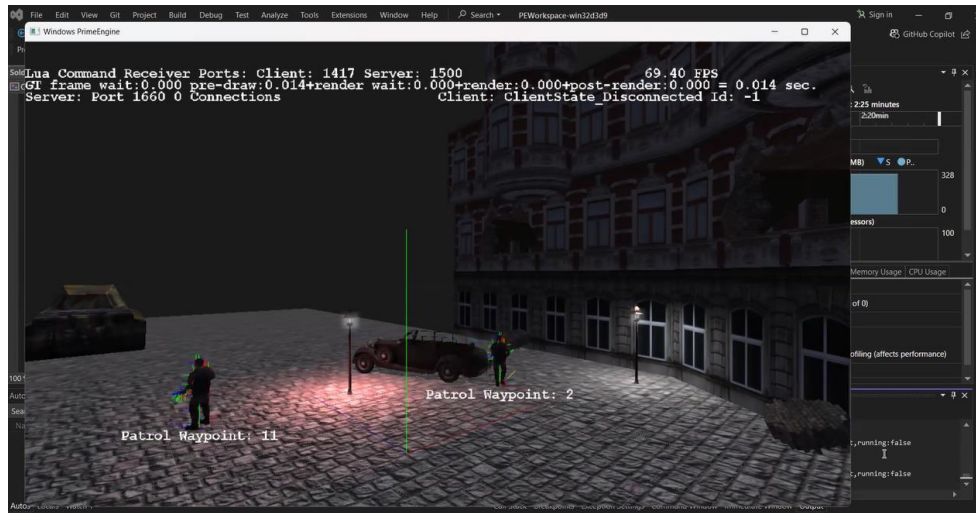
Change the speed in do_update

Add m_running = false

SoldierNPCMovementSM.h

Add Event handler wrapper

Add bool m_running variable



7) T6 Adding custom data:

Modifying existing events in a game engine to make a character walk & run at specific waypoints.

Waypoint.h

Add int m_needToRunToThisWaypoint

Waypoint.py

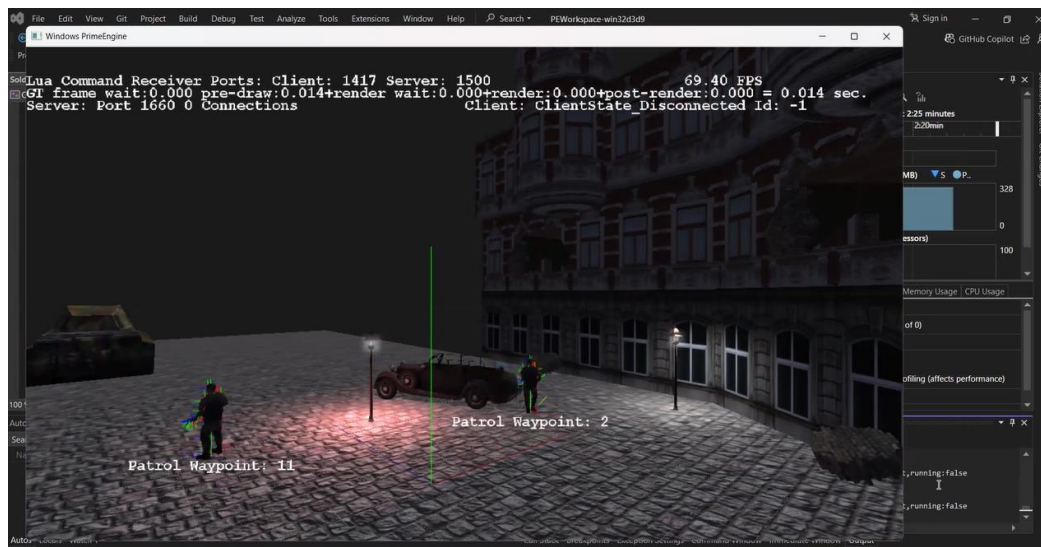
args['needToRunToThisWaypoint'] = 0

Waypoint.lua

Add needToRunToThisWaypoint

Waypoint.cpp

Add needToRunToThisWaypoint in construct



[Task 1] Soldier #1 - Choose Between Waypoints

Add ability to specify more than one next waypoint (up to 3) in waypoint script. Then in code choose one randomly whenever soldier chooses next waypoint. This should make Soldier #1 have a more randomized movement instead of circling the car.

I've added two new "next" values in the waypoint function. When the event `do_SoldierNPCMovementSM_Event_TARGET_REACHED` is triggered, it randomly selects one of the three next values. This allows the soldier to have random movements, moving continuously through points 5 to 8 while the others are selected at random.

```

-- this script is in lua format
-- this is a meta script that fills in data that is pas
-- some of the data can be set by default, some of the
function fillMetaInfoTable(args) -- the script fromat z

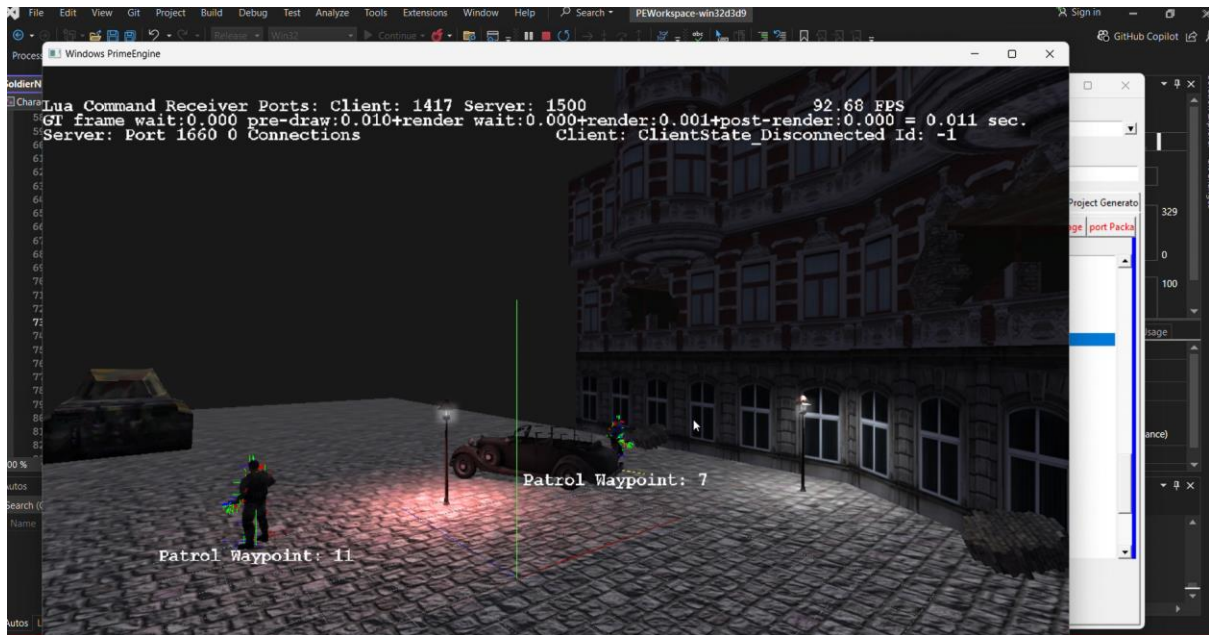
-- user modified data
args['myScript']="WayPoint.lua"
args['myScriptPackage']="CharacterControl"

args['name'] = ''
args['next'] = ''
args['next2'] = ''
args['next3'] = ''

args['needToRunToThisWaypoint'] = 0

end -- required

```



Waypoint.h

Add char m_nextWaypointName3
m_nextWaypointName3

Waypoint.py

Add args['next2'] args['next3']

Waypoint.lua

Add args['next2'] args['next3']

Waypoint.cpp

Add nextWayPointName2
nextWayPointName3

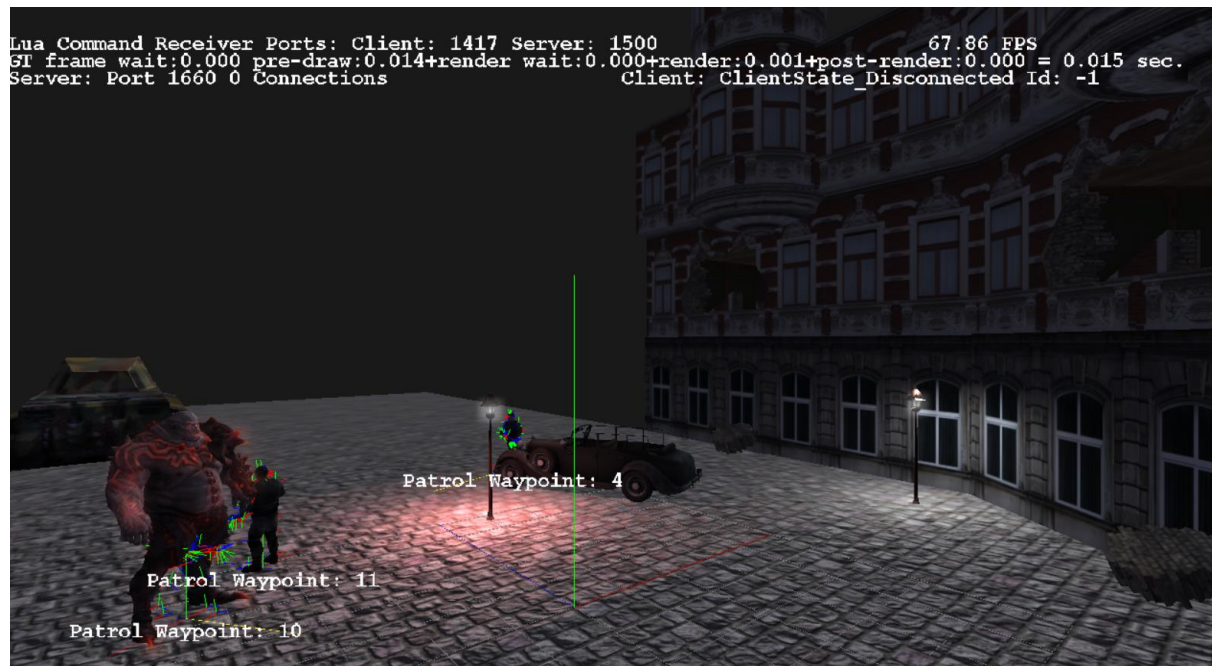
[Task 2] Soldier #2 - Tracking New Object

Create a new object type called Target (similar to what is done in first two tutorials). Add ability to SoldierNPC to turn to the target and play shooting animation (SoldierNPCAnimationSM::STAND_SHOOT). Trigger this ability on the soldier that goes into idle (not the soldier that keeps running around the car). Note, it is acceptable to just repurpose soldier object as a target, by adding some parameters so that on code side you could use imrod mesh instead of soldier skinned mesh.

The target should be moving close to soldier. Doesn't really matter what movement pattern it is (can be circling around soldier) as long as it moves and the soldier keeps turning towards it. Use imrod mesh for the Target object.

I've added two new events for shooting and rotation. I created a script for the NPC that allows it to accept additional parameters like npctype and patrolwaypoint. The code has been updated so that the soldier rotates to face the imrod using a shoot event, which takes the imrod's position as input. Once the soldier is facing the imrod, he shoots at it.

```
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15  args['skinPackage'] = "Default"
16
17  args['gunMeshName'] = "m98.x_m98main_mesh.mesha"
18  args['gunMeshPackage'] = "CharacterControl"
19  |
20  args['npcType'] = 'Enemy'
21  args['patrolWayPoint'] = ''
22
23  end -- required
24  ''
25
```

SoldierNPC.h

Add char m_enemyTarget,char m_objName

SoldierNPC_Target.py

Add args['enemyTarget'], args['objName']

SoldierNPC_Target.lua

Add args['enemyTarget'], args['objName']

SoldierNPCBehaviorSM.cpp

Add if m_state == SHOOT

Run SoldierNPCMovementSM_Event_STAND_SHOOT

SoldierNPCAnimationSM.cpp

Add

do_SoldierNPCAnimSM_Event_STAND_SHOOT

SoldierNPCAnimationSM.h

Add event handler for SHOOT

GlobalRegistry.cpp

Add Function for SHOOT