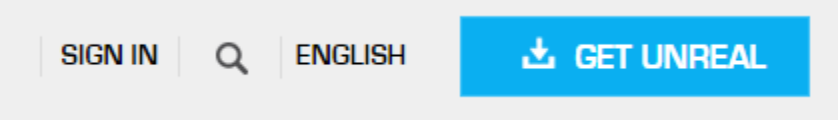
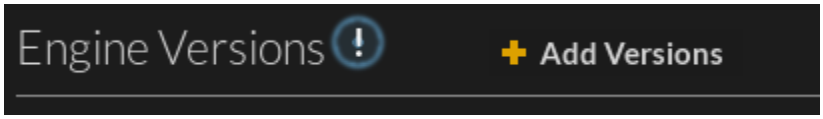
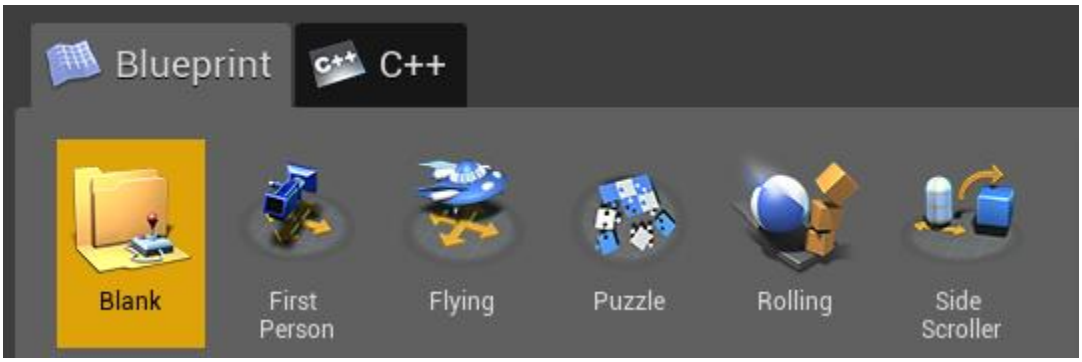
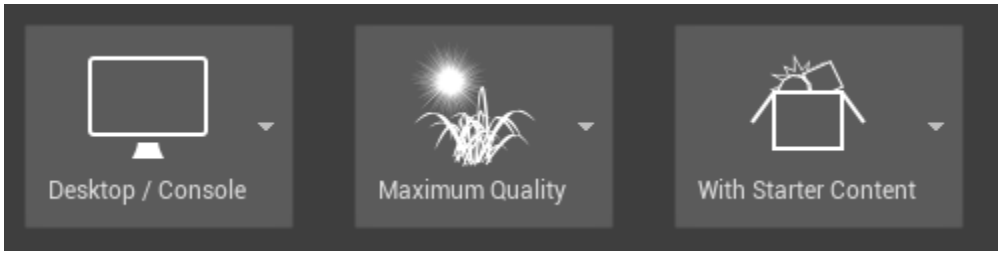
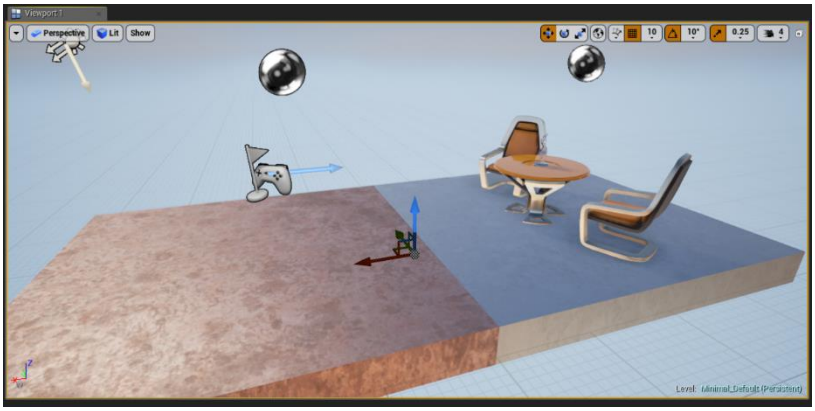
Chapter 1: Introduction to Unreal Engine 4

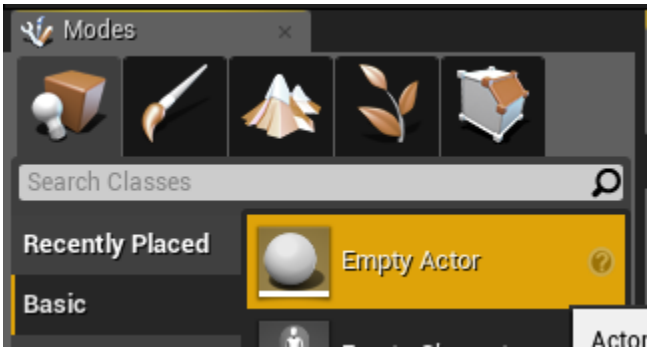


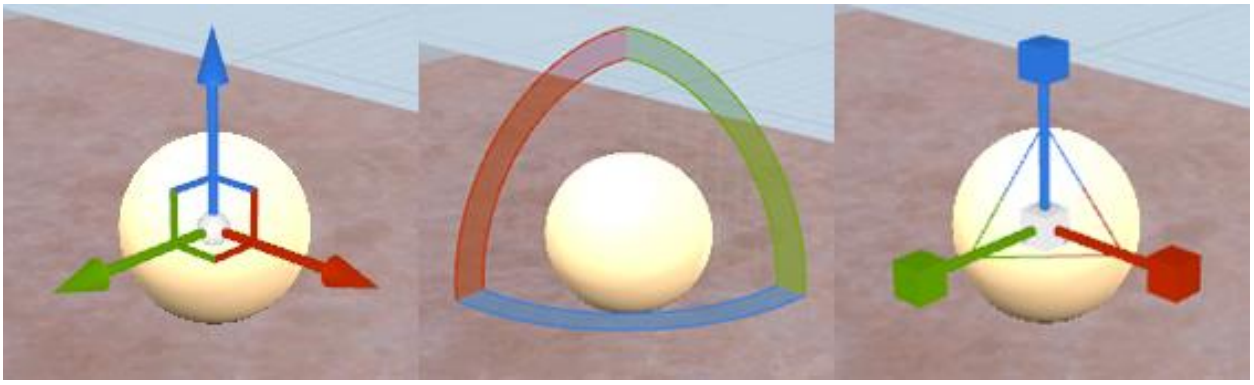


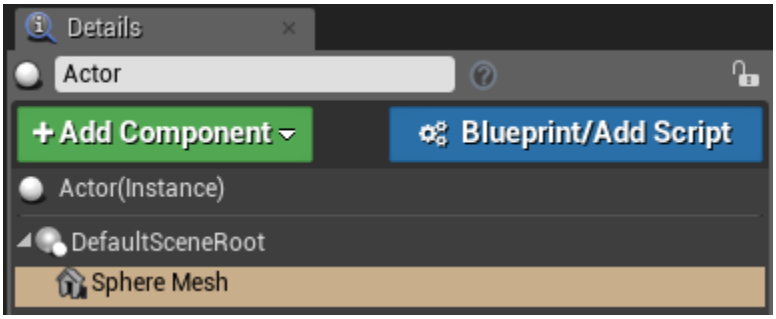


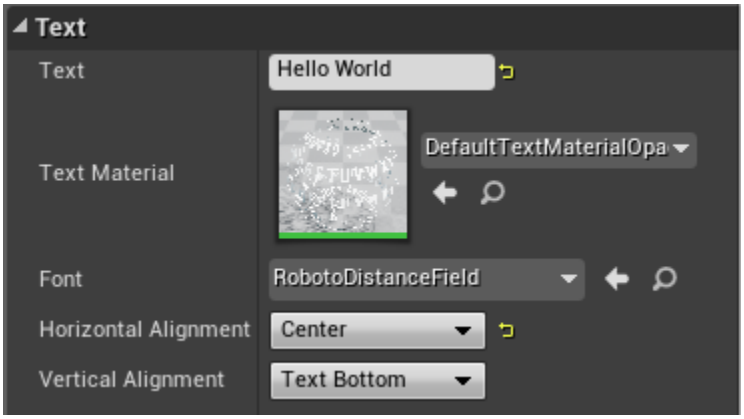


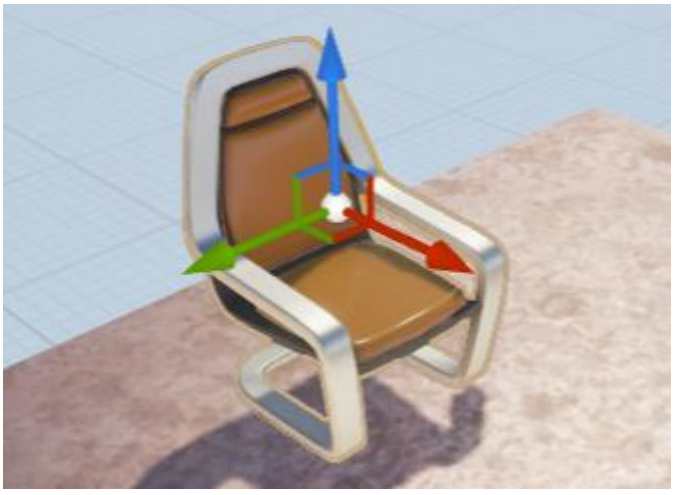



Modes
Search Classes
Recently Placed
Basic
Empty Actor



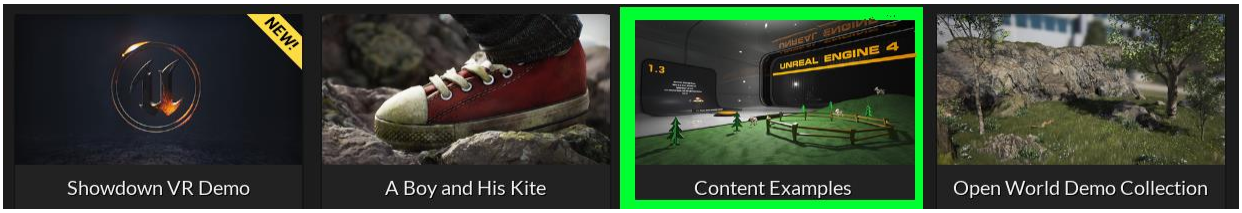

Details
Actor
+ Add Component
Blueprint/Add Script
Actor(Instance)
DefaultSceneRoot
Sphere Mesh


Text
Text
Hello World
Text Material
DefaultTextMaterialOpa
Font
RobotoDistanceField
Horizontal Alignment
Center
Vertical Alignment
Text Bottom

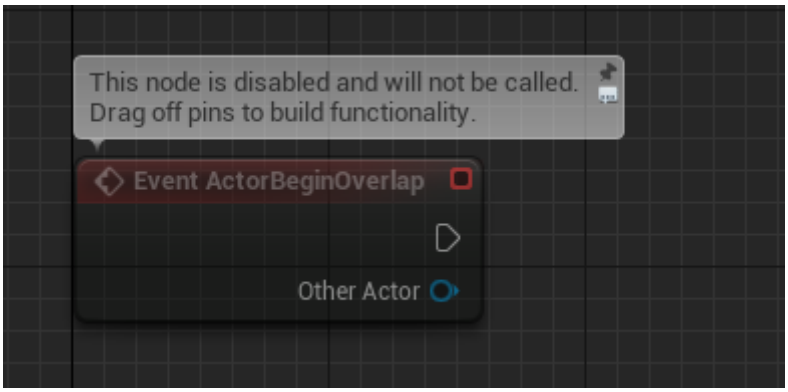


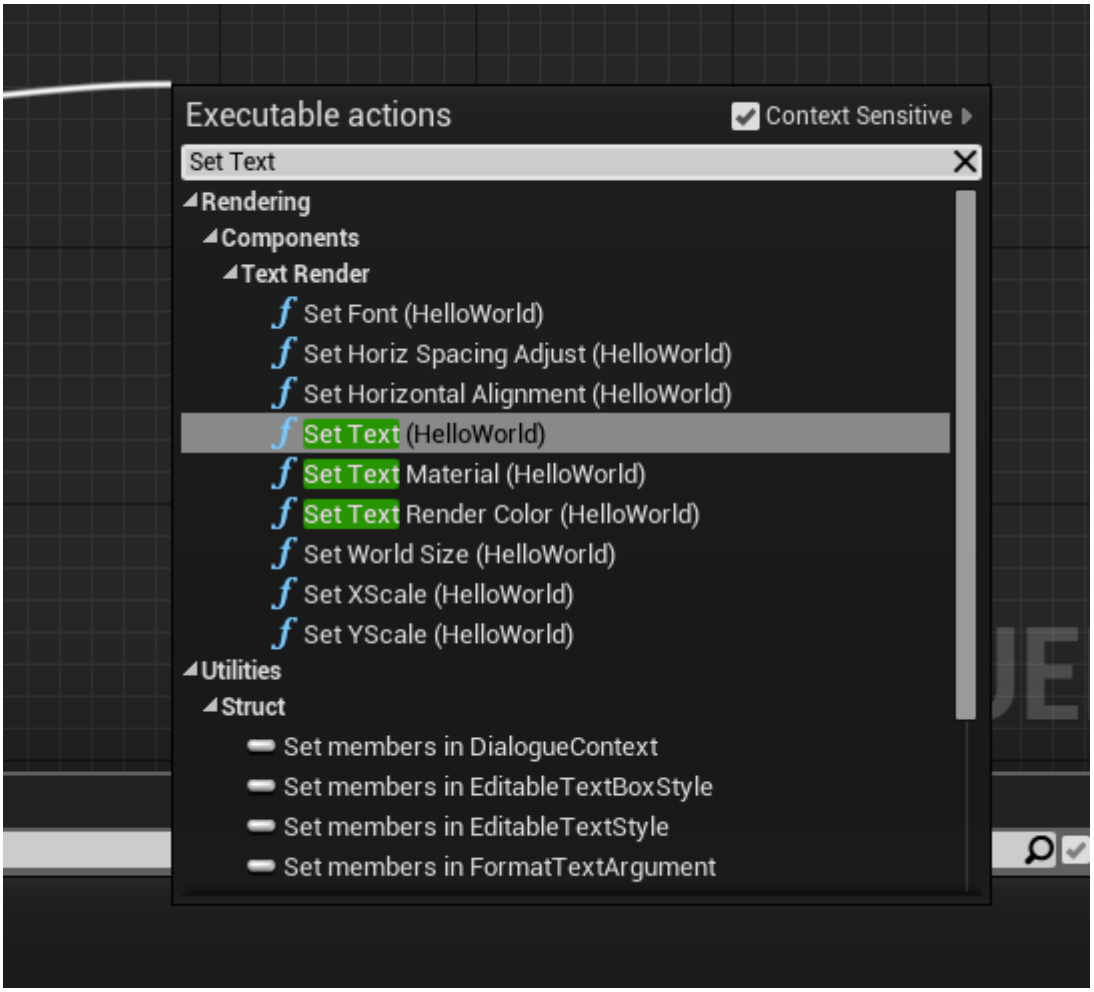
Hello World

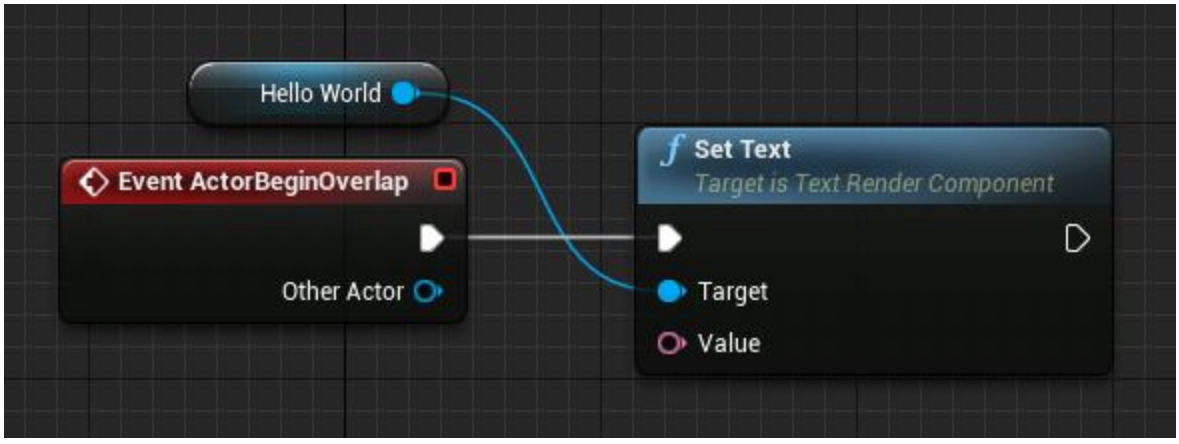
Hello World


NEW!
Showdown VR Demo
A Boy and His Kite
UNREAL ENGINE 4
Content Examples
Open World Demo Collection

Chapter 2: Blueprints and Barrels – Your First Game

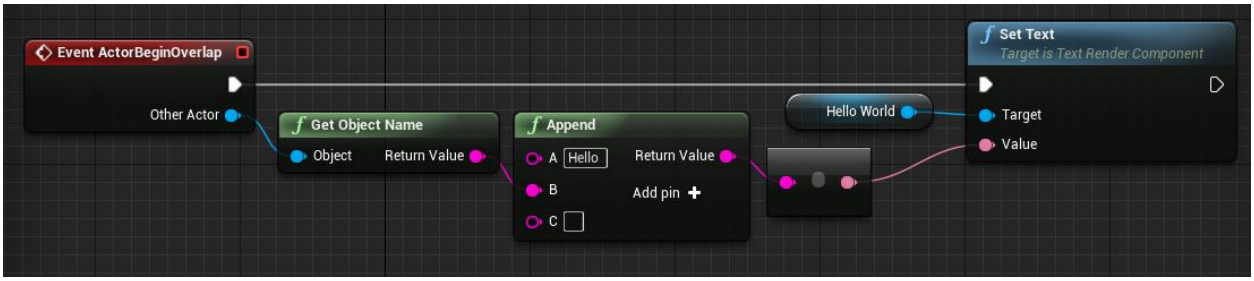


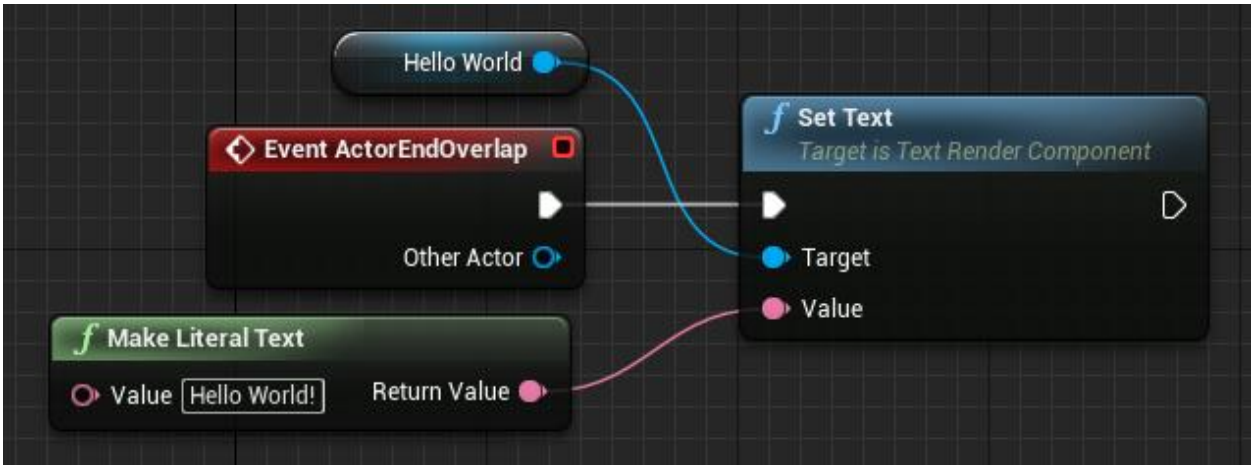


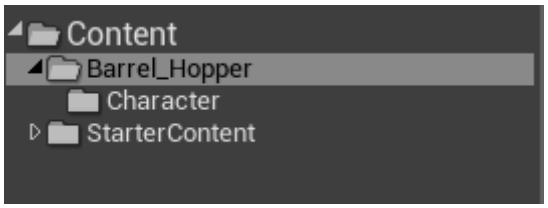


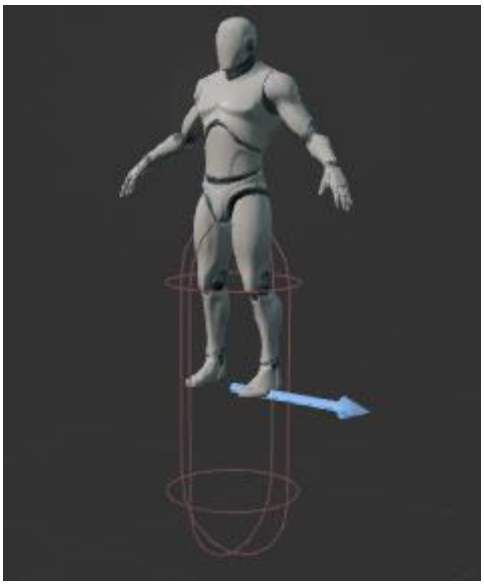
This blueprint (self) is not a TextRenderComponent, therefore ' Target ' must have a connection.
The current value of the ' Value ' pin is invalid: 'Value' must have an input wired into it ("by ref" params expect a valid input to operate on).
[0076.18] Compile of Hello_Sphere_Blueprint failed. 2 Fatal Issue(s) 0 Warning(s) [in 216 ms]

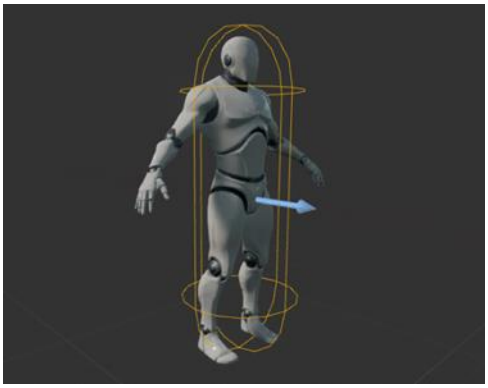
Hello Player

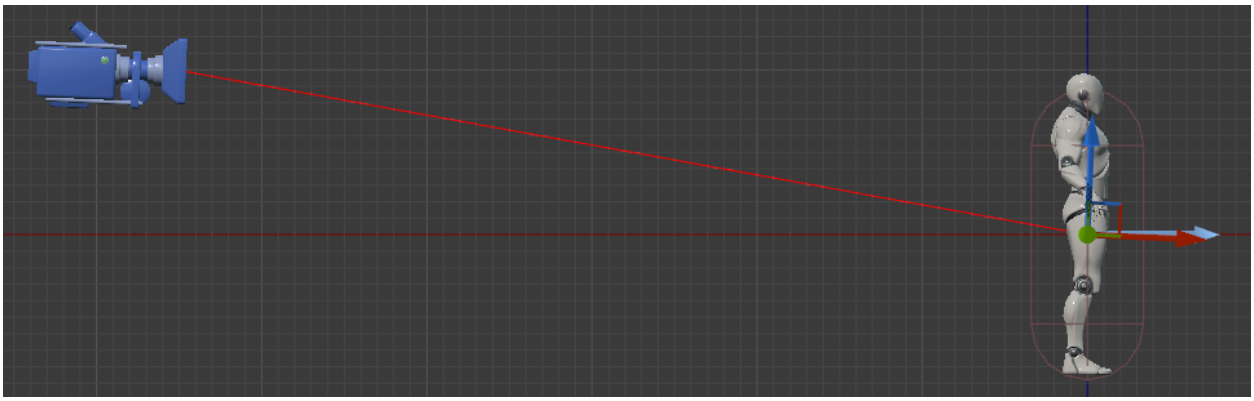

Event ActorBeginOverlap
Other Actor
Get Object Name
Object
Return Value
Append
A
Hello
B
Add pin
C
Return Value
Hello World
Set Text
Target is Text Render Component
Target
Value


Hello World
Event ActorEndOverlap
Other Actor
Set Text
Target is Text Render Component
Target
Value
Make Literal Text
Value
Hello World!
Return Value

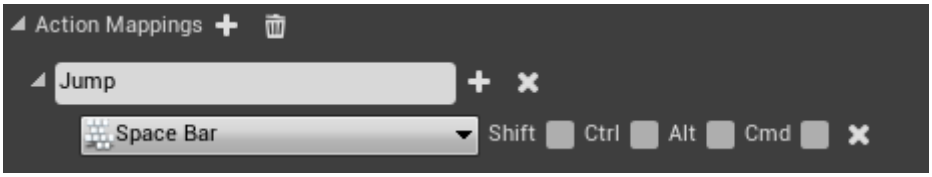

Content
Barrel_Hopper
Character
StarterContent

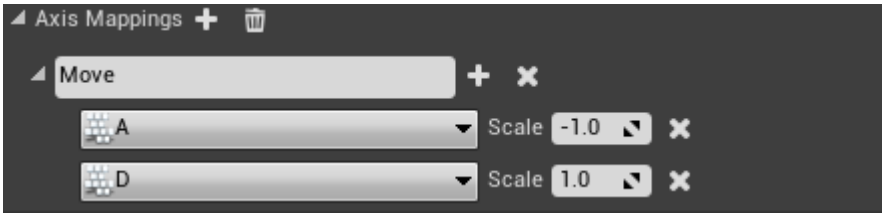


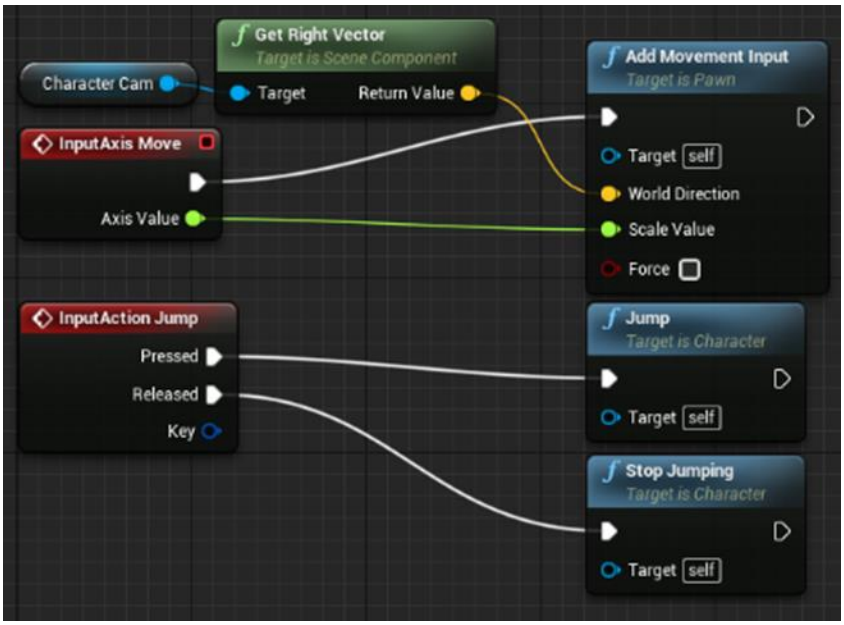




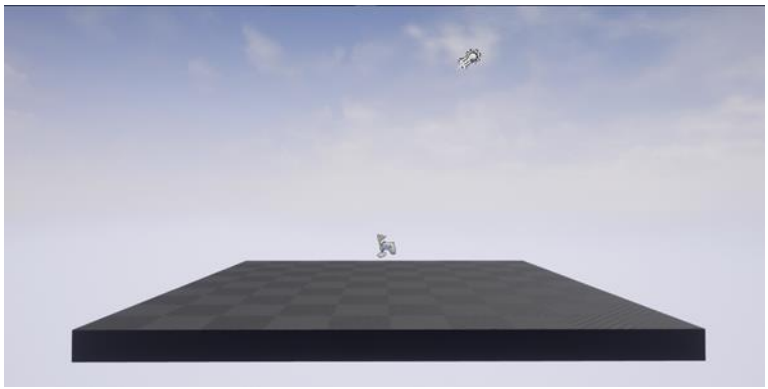
Action Mappings

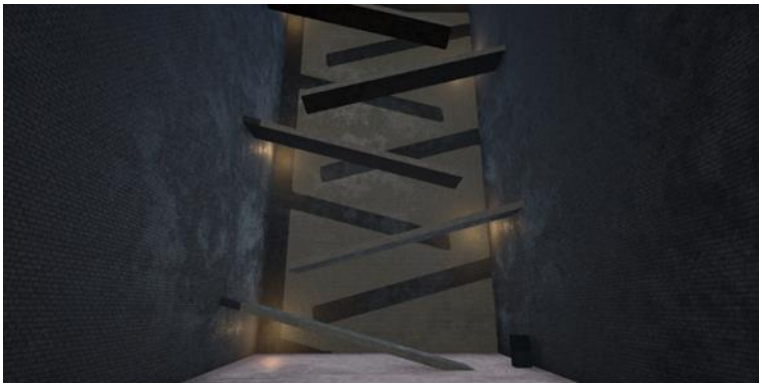

Action Mappings
Jump
Space Bar
Shift
Ctrl
Alt
Cmd


Axis Mappings
Move
A
Scale
-1.0
D
Scale
1.0

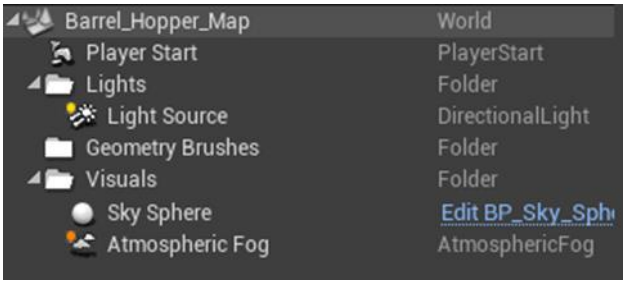

Get Right Vector
Target is Scene Component
Character Cam
Target
Return Value
Add Movement Input
Target is Pawn
InputAxis Move
Target self
World Direction
Axis Value
Scale Value
Force
InputAction Jump
Jump
Target is Character
Pressed
Released
Key
Target self
Stop Jumping
Target is Character
Target self

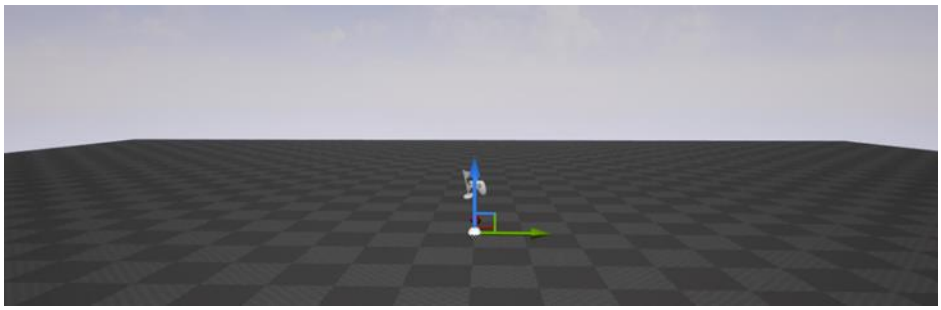
Character Movement (General Settings)
Gravity Scale 2.0
Max Acceleration 2048.0
Braking Friction Factor 2.0
Braking Friction 0.0
Use Separate Braking Frictic
Crouched Half Height 40.0
Rotation Rate Roll 0.0 Pitch 0.0 Yaw 720.0
Orient Rotation to Movemen
Mass 100.0
Default Land Movement Mo Walking
Default Water Movement Mc Swimming
Character Movement: Jumping / Falling
Jump Z Velocity 1000.0
Braking Deceleration Falling 0.0
Air Control 0.8
Air Control Boost Multiplier 2.0
Air Control Boost Velocity TI 25.0
Falling Lateral Friction 0.0
Impart Base Velocity X
Impart Base Velocity Y
Impart Base Velocity Z
Impart Base Angular Velocity
Notify Apex



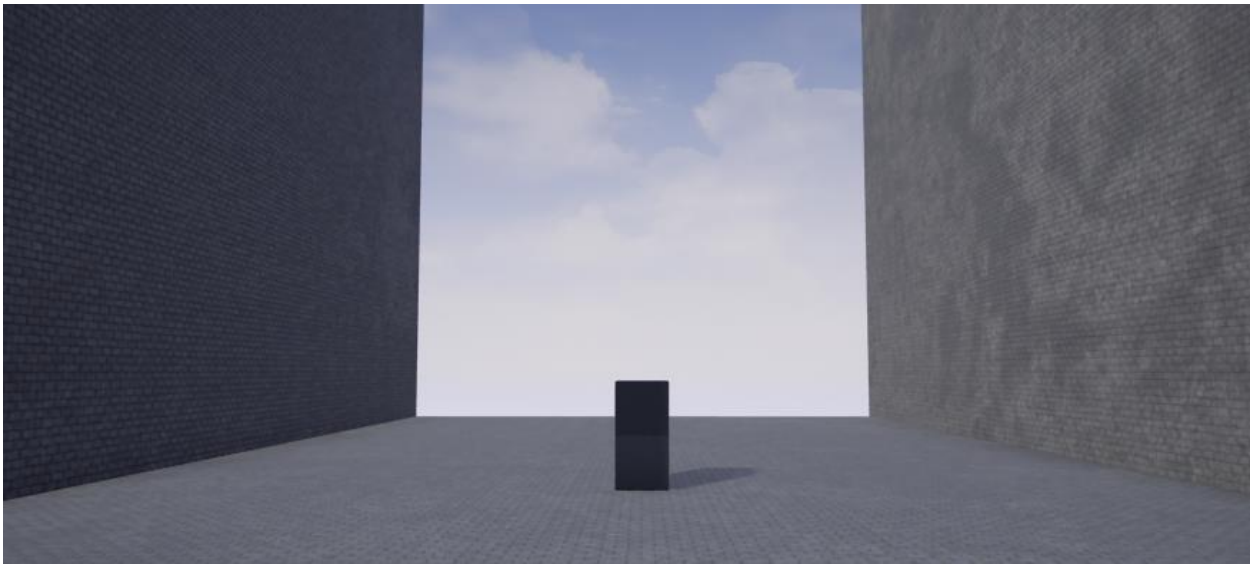


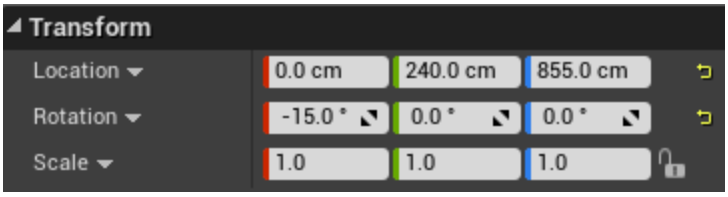
Perspective
Lit
Show

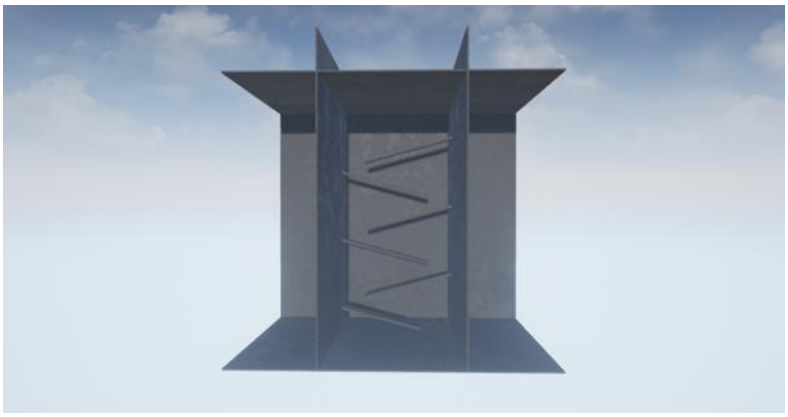

Barrel_Hopper_Map
World
Player Start
PlayerStart
Lights
Folder
Light Source
DirectionalLight
Geometry Brushes
Folder
Visuals
Folder
Sky Sphere
Edit BP_Sky_Sph
Atmospheric Fog
AtmosphericFog



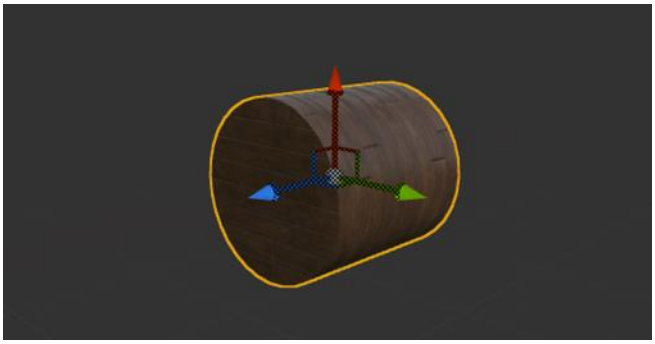
Polygons
Solidity
Order
Align Brush Vertices
Create Static Mesh

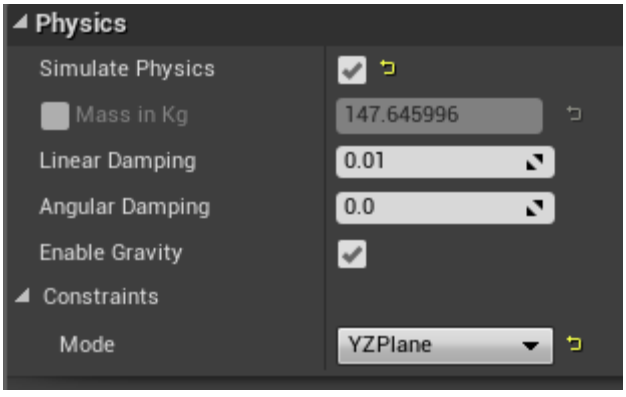


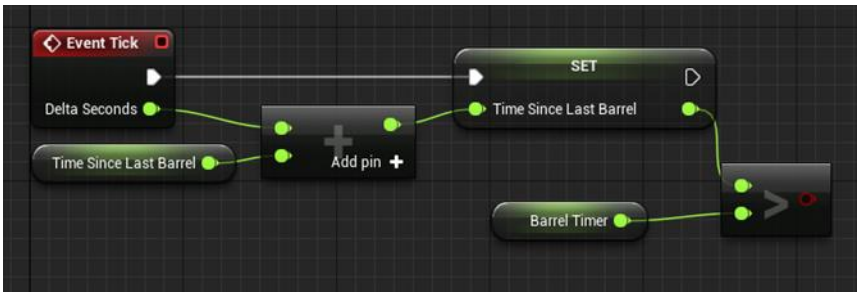

Transform
Location
0.0 cm
240.0 cm
855.0 cm
Rotation
-15.0 °
0.0 °
0.0 °
Scale
1.0
1.0
1.0

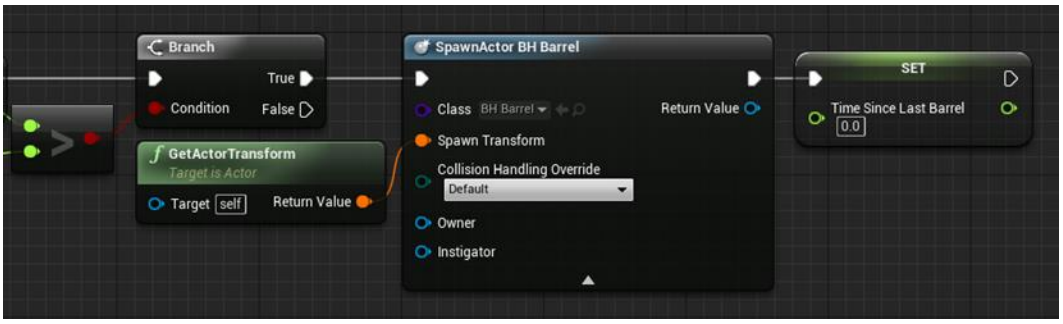


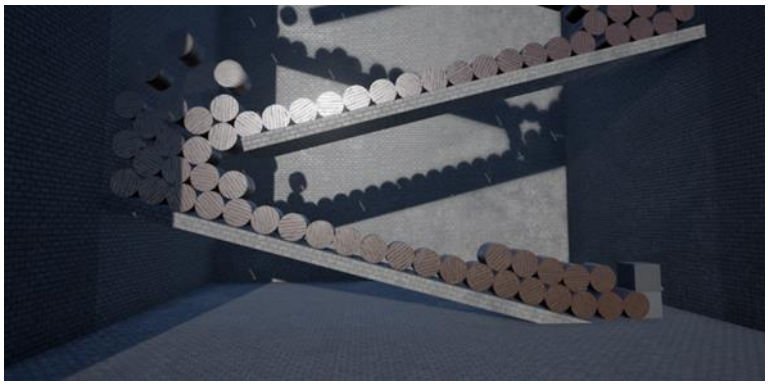
Blueprints
Matinee
Build
Play
Launch
Lighting
Build Lighting Only
Ctrl+Shift+Semicolon
Lighting Quality

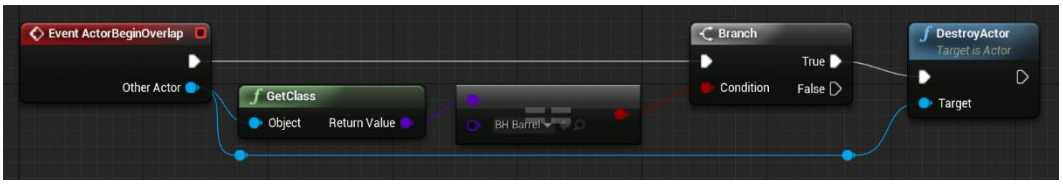


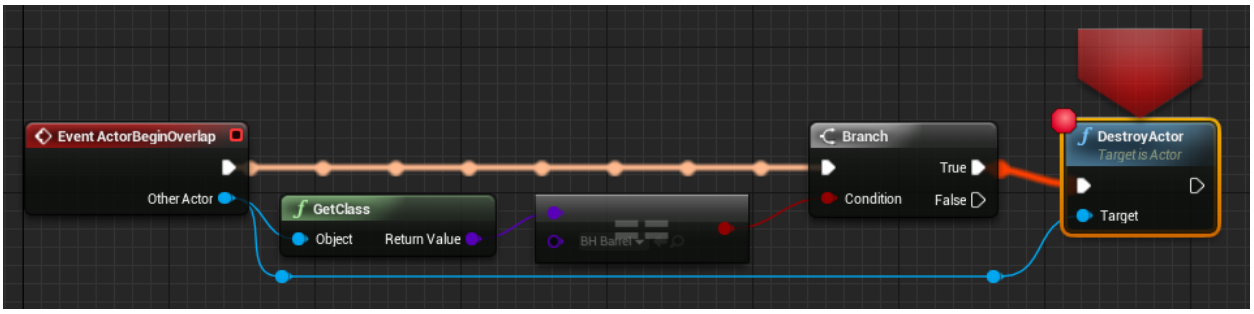

Physics
Simulate Physics
Mass in Kg
147.645996
Linear Damping
0.01
Angular Damping
0.0
Enable Gravity
Constraints
Mode
YZPlane

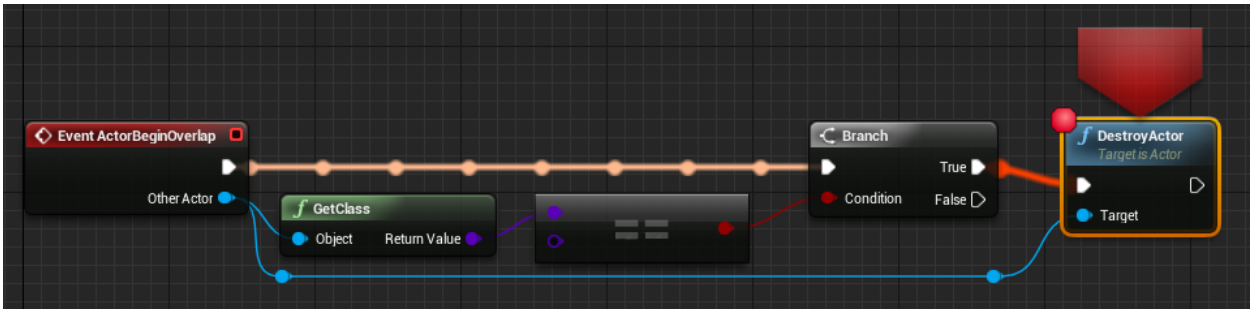

Event Tick
Delta Seconds
Time Since Last Barrel
Add pin
SET
Time Since Last Barrel
Barrel Timer

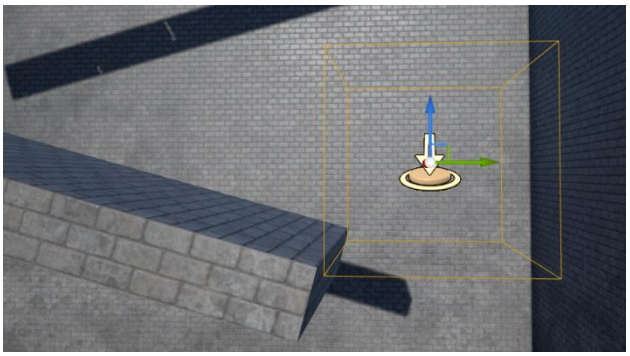

Branch
True
Condition
False
GetActorTransform
Target is Actor
Target
self
Return Value
SpawnActor BH Barrel
Class
BH Barrel
Return Value
Spawn Transform
Collision Handling Override
Default
Owner
Instigator
SET
Time Since Last Barrel
0.0

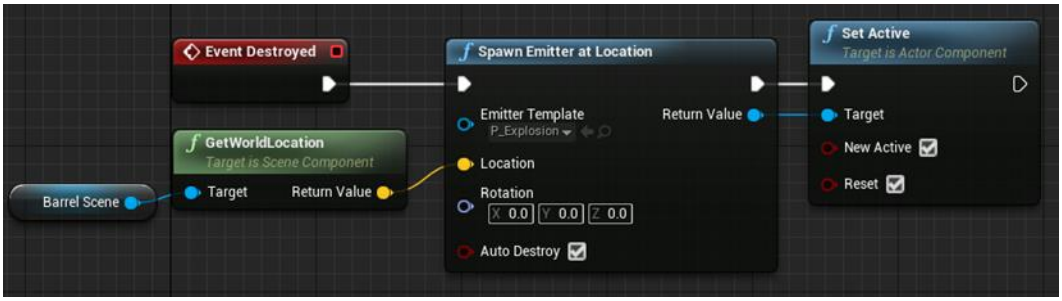


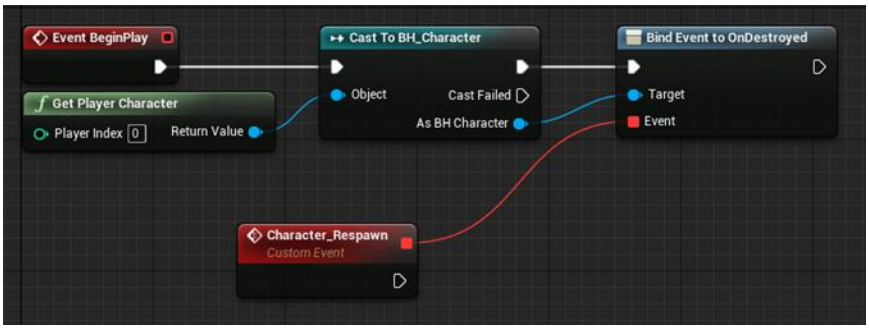

Event ActorBeginOverlap
Other Actor
GetClass
Object
Return Value
BH Barrel
Branch
True
Condition
False
DestroyActor
Target is Actor
Target

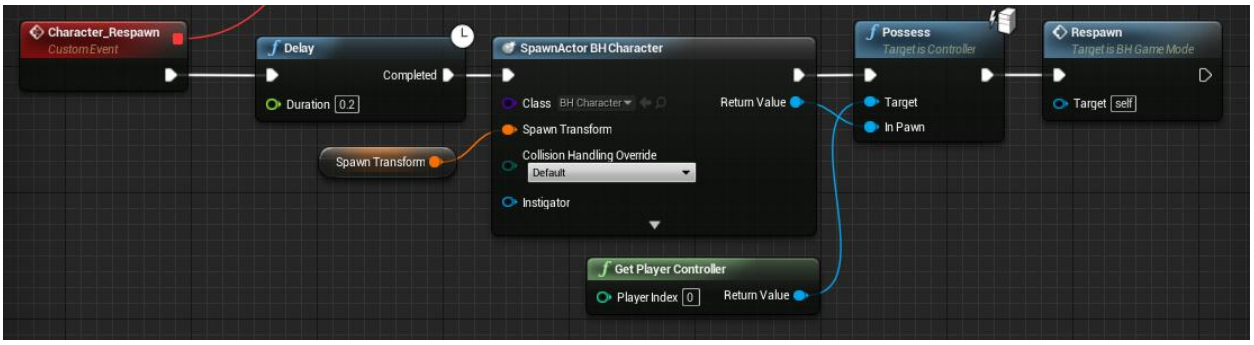

Event ActorBeginOverlap
Other Actor
GetClass
Object
Return Value
Branch
True
Condition
False
DestroyActor
Target is Actor
Target

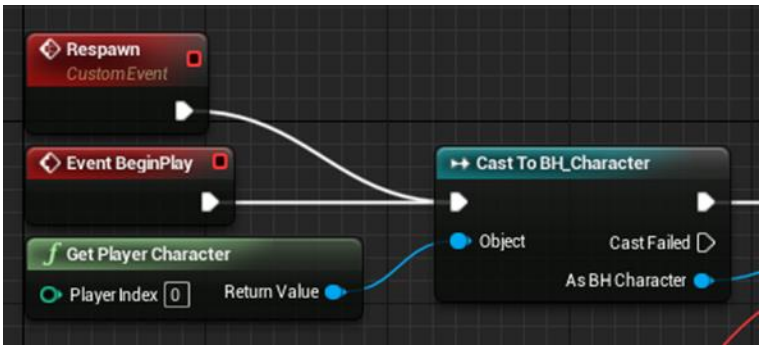

Event ActorBeginOverlap
Other Actor
GetClass
Object
Return Value
Branch
True
Condition
False
DestroyActor
Target is Actor
Target

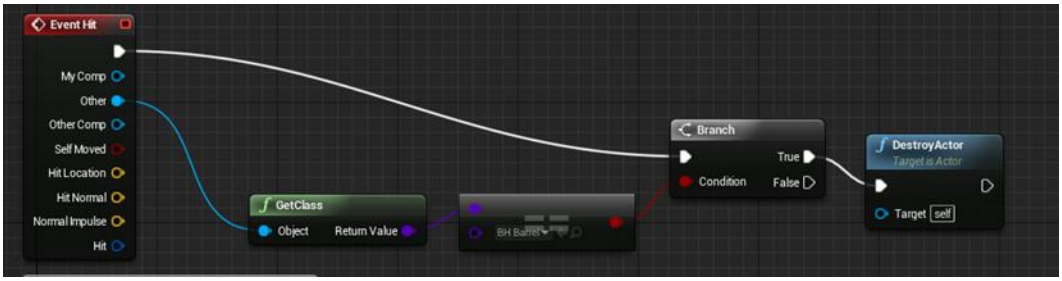


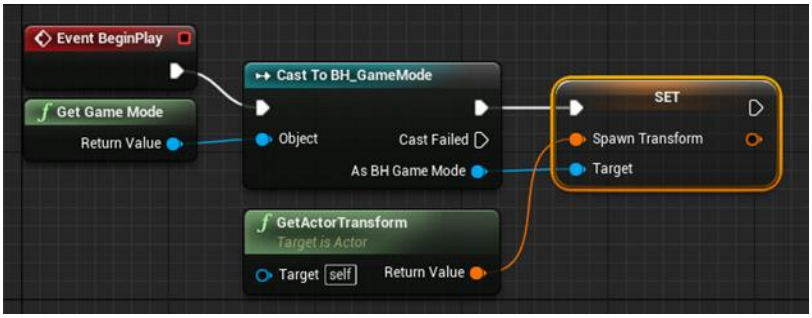

Event Destroyed
Spawn Emitter at Location
Set Active
Target is Actor Component
Emitter Template
P_Explosion
Return Value
Target
GetWorldLocation
Target is Scene Component
Location
New Active
Barrel Scene
Target
Return Value
Rotation
X 0.0
Y 0.0
Z 0.0
Reset
Auto Destroy


Event BeginPlay
Cast To BH_Character
Bind Event to OnDestroyed
Get Player Character
Object
Cast Failed
Target
Player Index 0
Return Value
As BH Character
Event
Character_Respawn
Custom Event

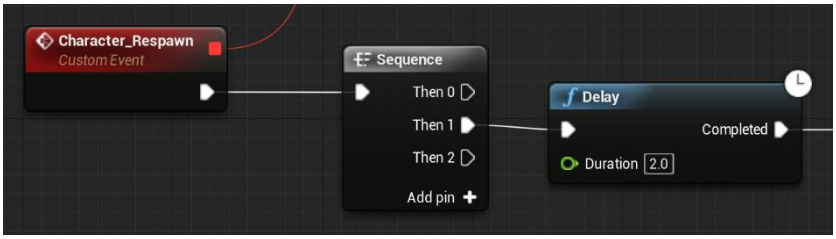

Character_Respawn
Custom Event
Delay
Completed
Duration 0.2
SpawnActor BH Character
Class BH Character
Return Value
Spawn Transform
Collision Handling Override
Default
Instigator
Possess
Target is Controller
Target
In Pawn
Respawn
Target is BH Game Mode
Target self
Spawn Transform
Get Player Controller
Player Index 0
Return Value

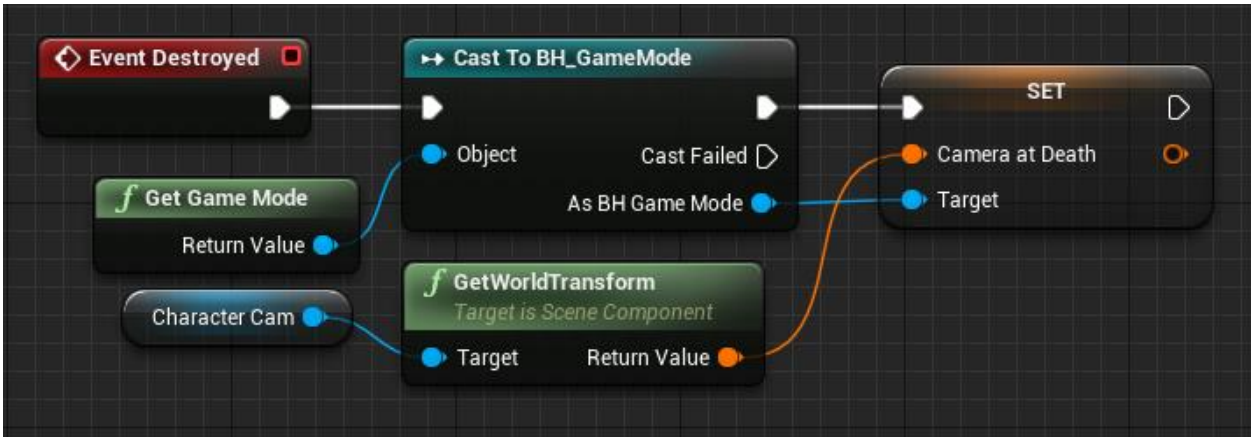

Respawn
Custom Event
Event BeginPlay
Cast To BH_Character
Object
Cast Failed
As BH Character
Get Player Character
Player Index 0
Return Value

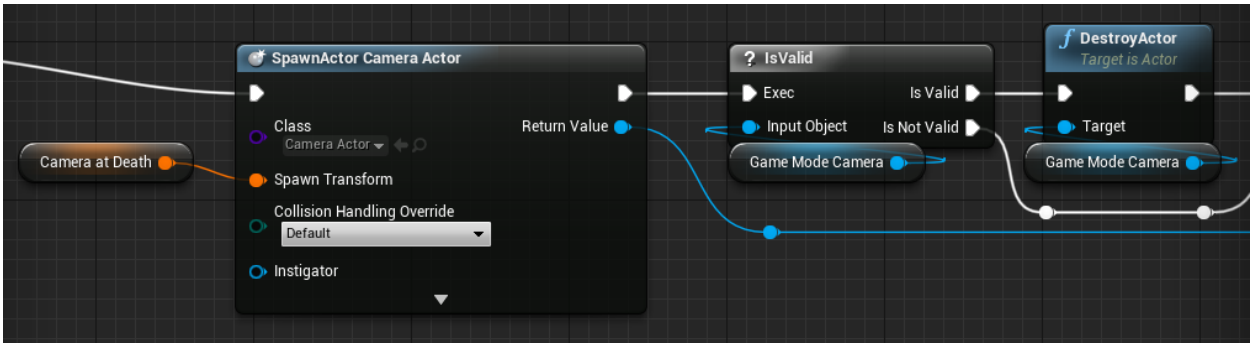

Event Hit
My Comp
Other
Other Comp
Self Moved
Hit Location
Hit Normal
Normal Impulse
Hit
Branch
True
Condition
False
DestroyActor
Target is Actor
Target self
GetClass
Object
Return Value

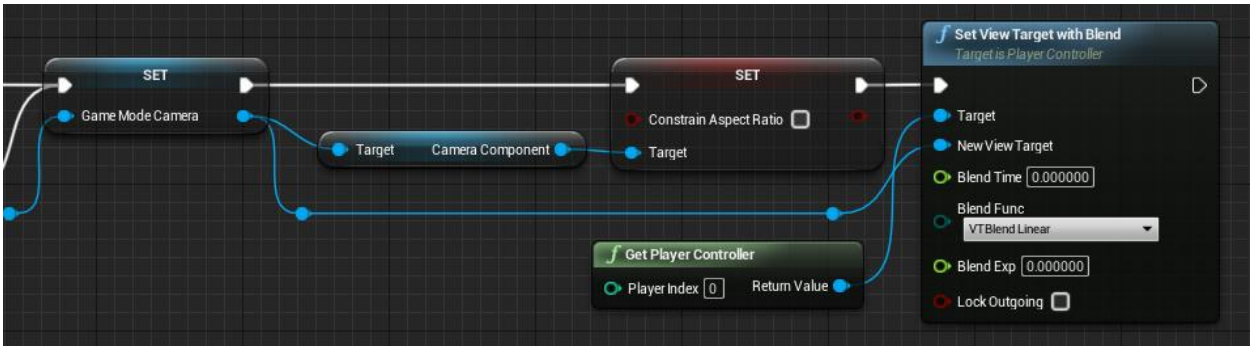

Event BeginPlay
Get Game Mode
Return Value
Cast To BH_GameMode
Object
Cast Failed
As BH Game Mode
GetActorTransform
Target is Actor
Target
self
Return Value
SET
Spawn Transform
Target

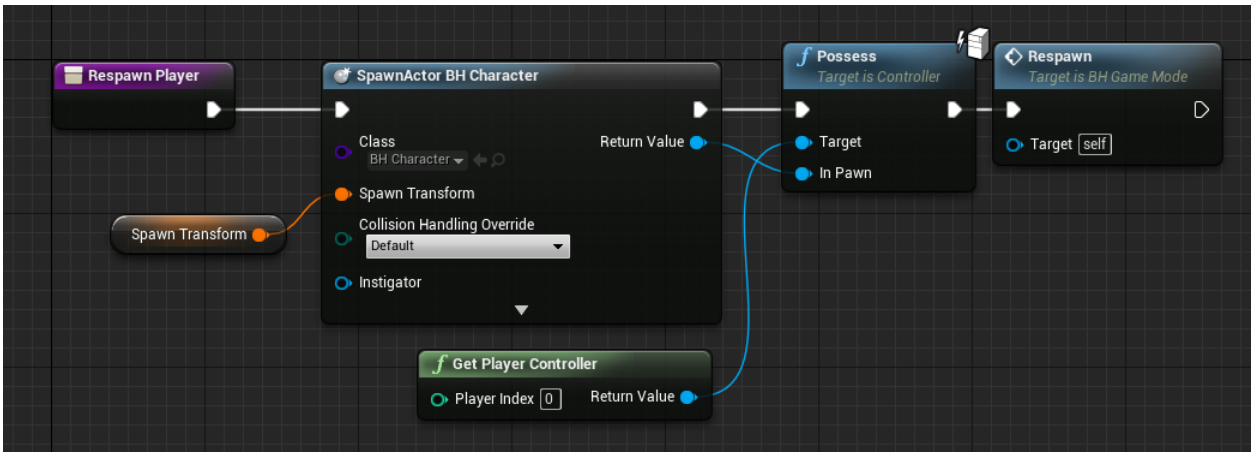
Chapter 3: Advanced Blueprint, Animation, and Sound





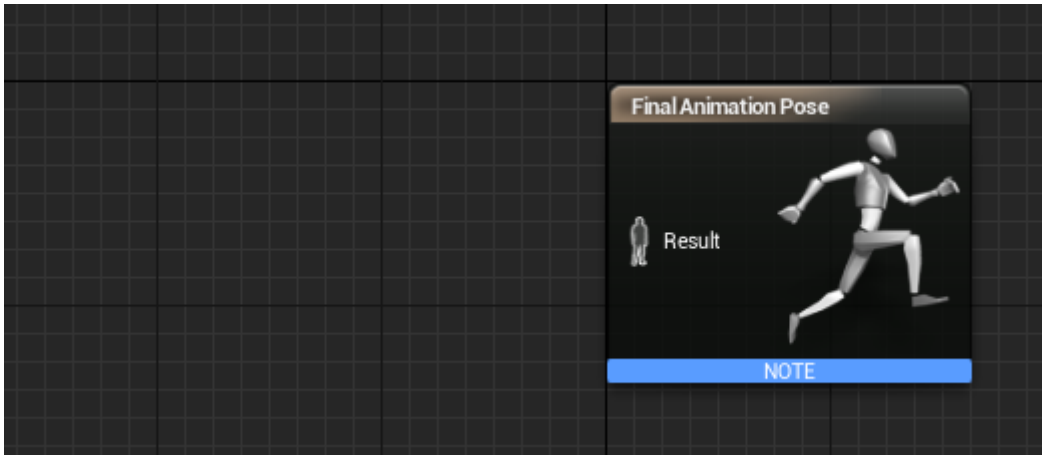


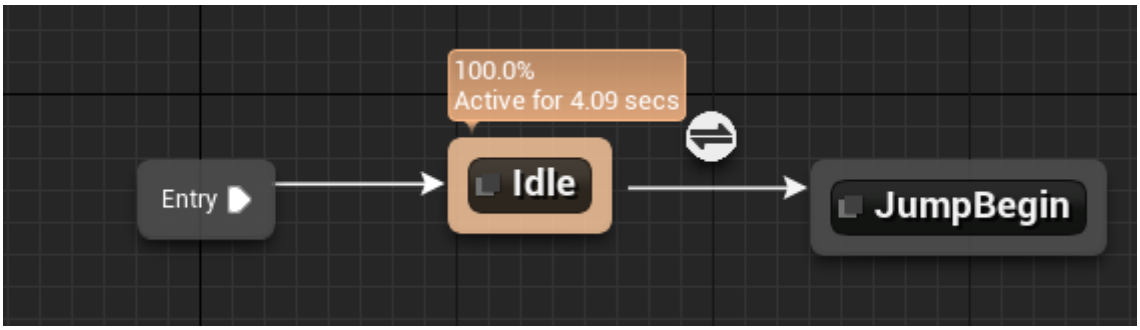

SET
Game Mode Camera
Target
Camera Component
SET
Constrain Aspect Ratio
Target
Set View Target with Blend
Target is Player Controller
Target
New View Target
Blend Time 0.000000
Blend Func
VTBlend Linear
Blend Exp 0.000000
Lock Outgoing
Get Player Controller
Player Index 0
Return Value


Respawn Player
SpawnActor BH Character
Class
BH Character
Return Value
Spawn Transform
Collision Handling Override
Default
Instigator
Spawn Transform
Possess
Target is Controller
Target
In Pawn
Respawn
Target is BH Game Mode
Target self
Get Player Controller
Player Index 0
Return Value

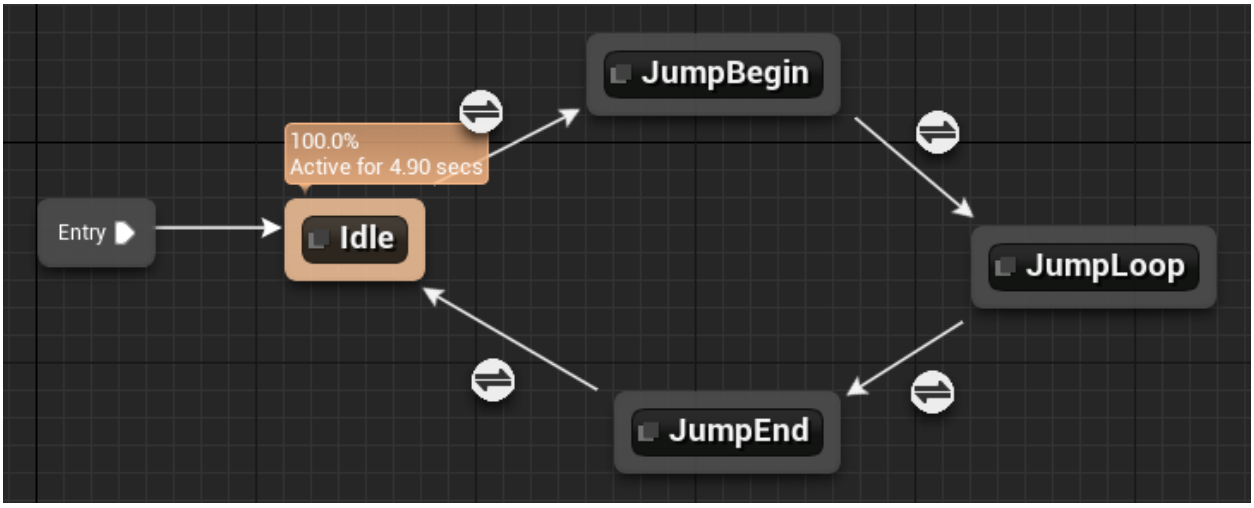
Respawn
Target is BH Game Mode
Target self
Game Mode Camera
Get Player Controller
Player Index 0
Return Value
Set View Target with Blend
Target is Player Controller
Target
New View Target
Blend Time 0.000000
Blend Func
VTBlend Linear
Blend Exp 0.000000
Lock Outgoing
Get Player Controller
Player Index 0
Return Value
Get Player Character
Player Index 0
Return Value
Set View Target with Blend
Target is Player Controller
Target
New View Target
Blend Time 1.0
Blend Func
VTBlend Cubic
Blend Exp 0.000000
Lock Outgoing

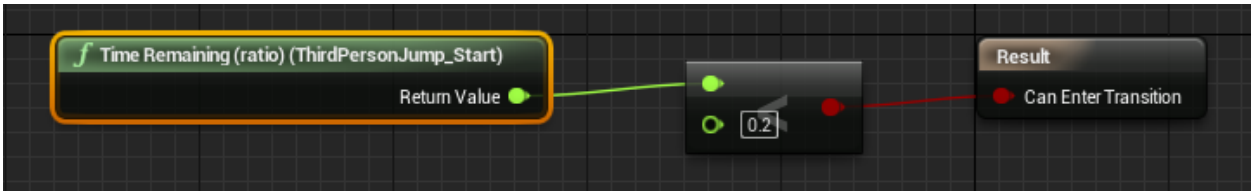
Skeleton
UE4_Mannequi
Mesh
SK_Mannequin
Animation
(None)
Graph
NewAnimBluep

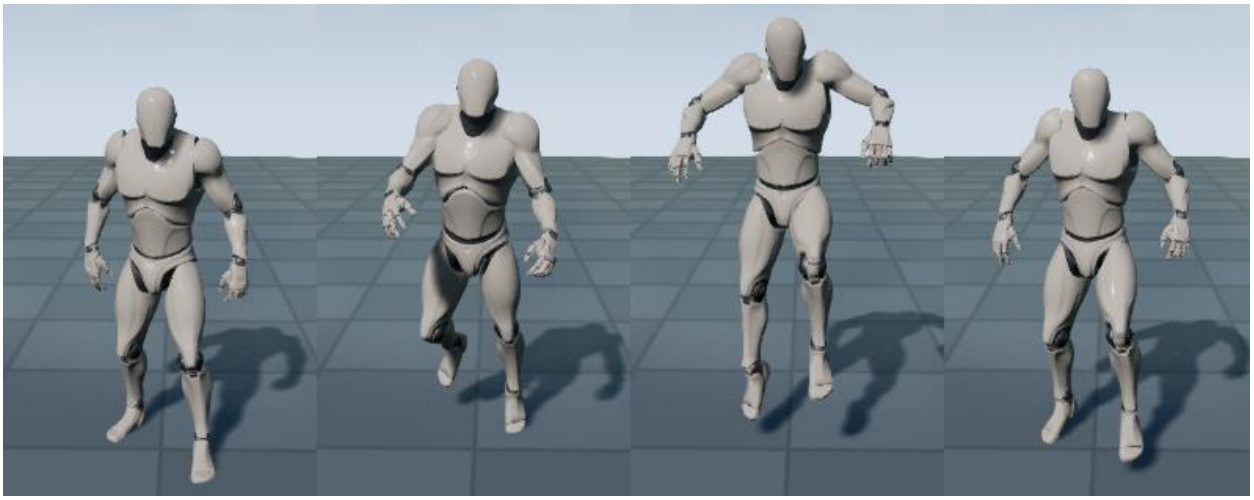


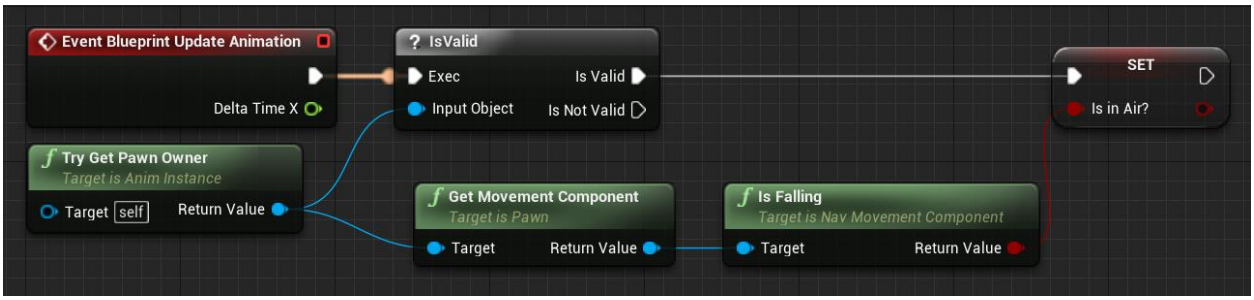


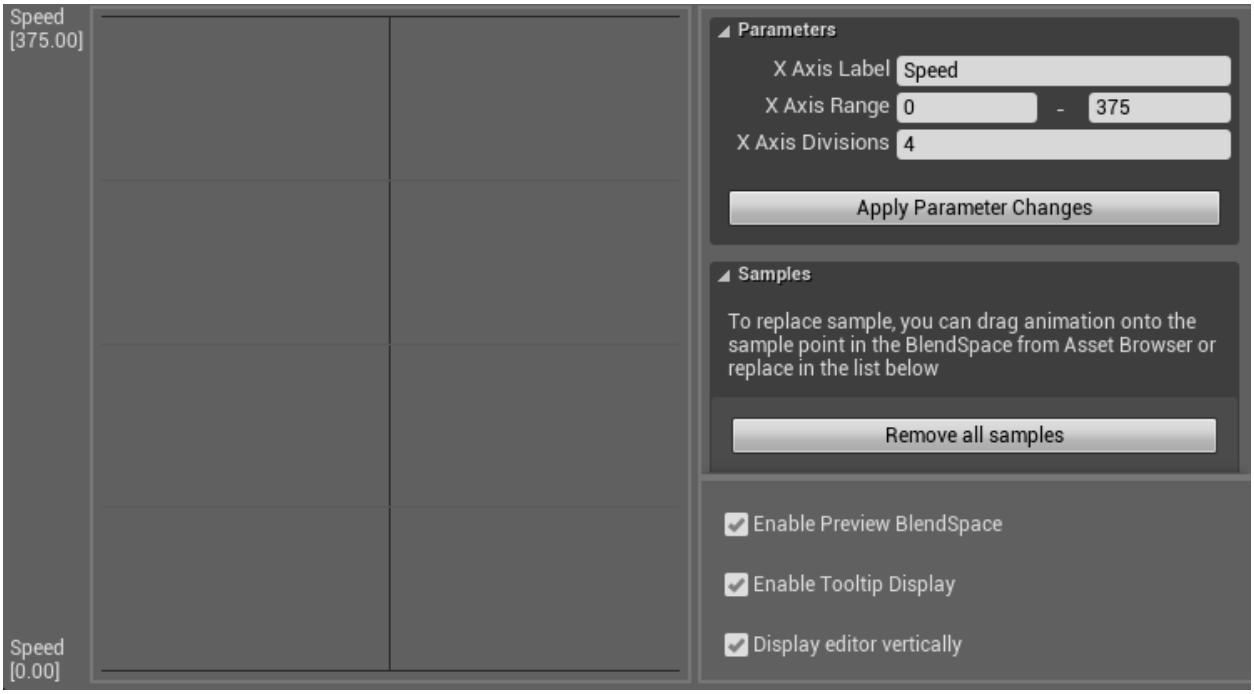
BH_Character_AnimBP > AnimGraph > Character_Locomotion > JumpBegin (state)

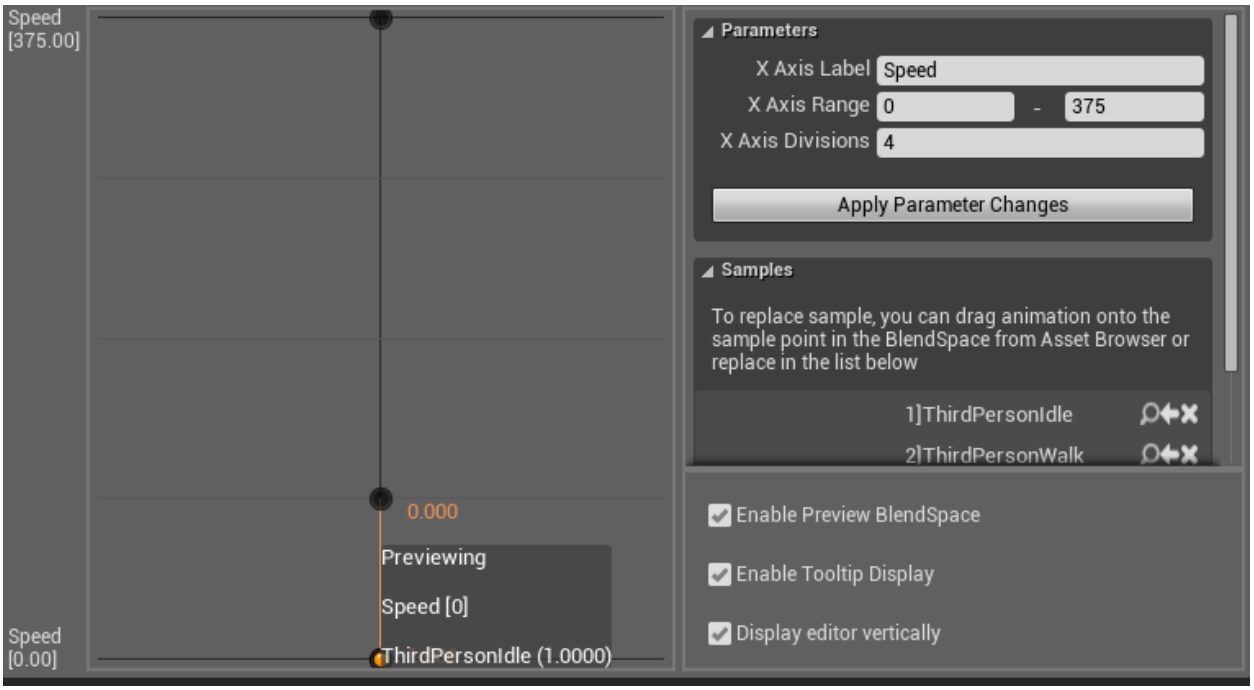


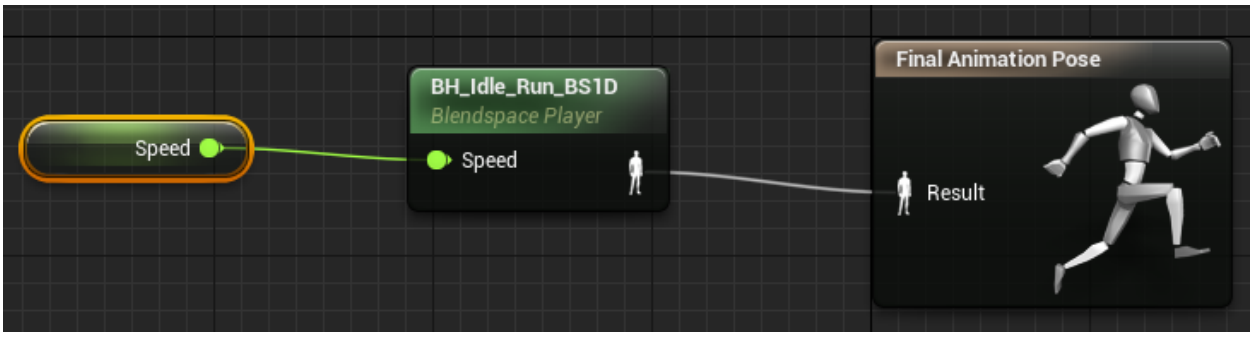

Time Remaining (ratio) (ThirdPersonJump_Start)
Return Value
0.2
Result
Can Enter Transition

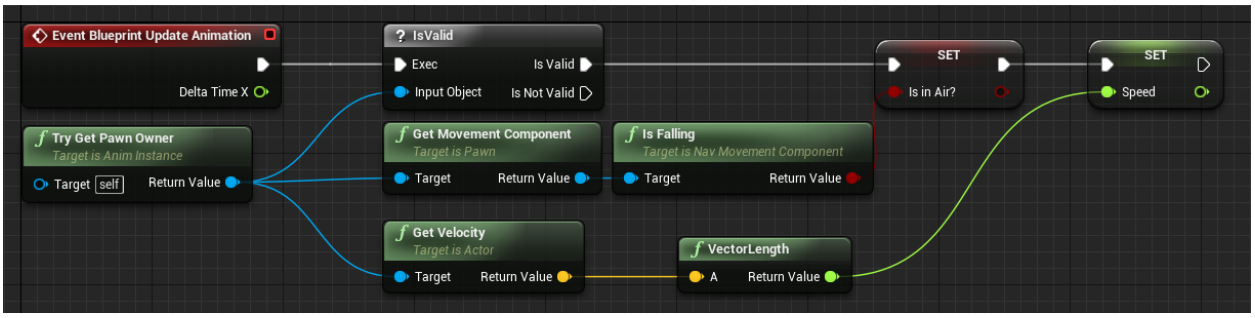



Event Blueprint Update Animation
Delta Time X
IsValid
Exec
Is Valid
Input Object
Is Not Valid
SET
Is in Air?
Try Get Pawn Owner
Target is Anim Instance
Target
self
Return Value
Get Movement Component
Target is Pawn
Target
Return Value
Is Falling
Target is Nav Movement Component
Target
Return Value

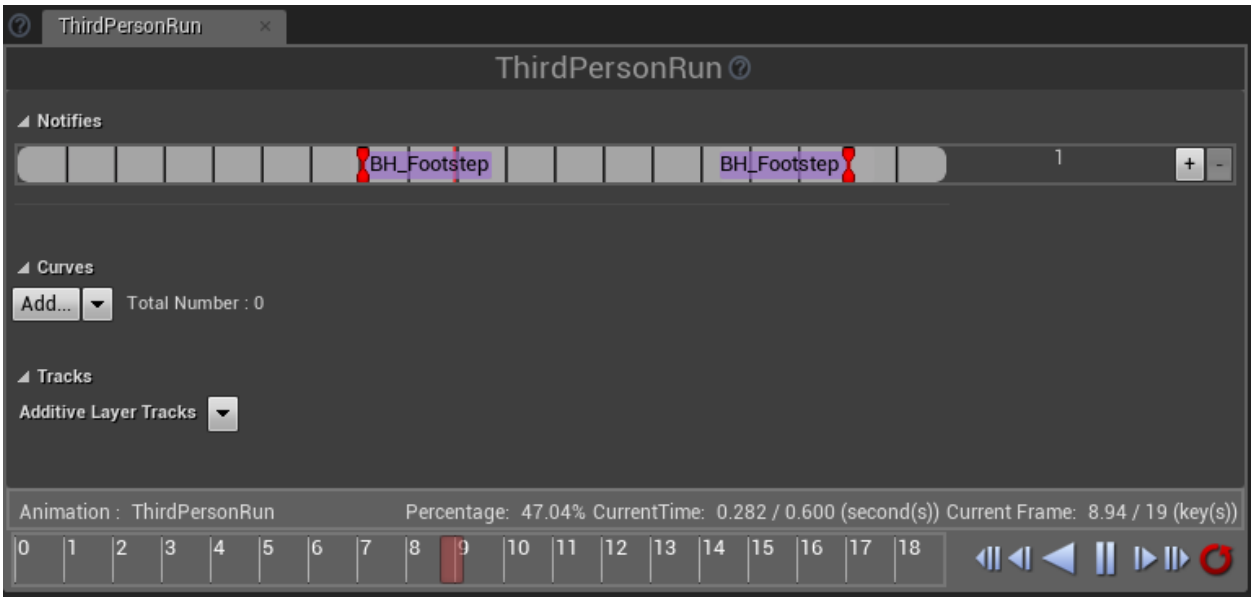

Speed
[375.00]
Parameters
X Axis Label
Speed
X Axis Range
0
-
375
X Axis Divisions
4
Apply Parameter Changes
Samples
To replace sample, you can drag animation onto the sample point in the BlendSpace from Asset Browser or replace in the list below
Remove all samples
Enable Preview BlendSpace
Enable Tooltip Display
Display editor vertically
Speed
[0.00]

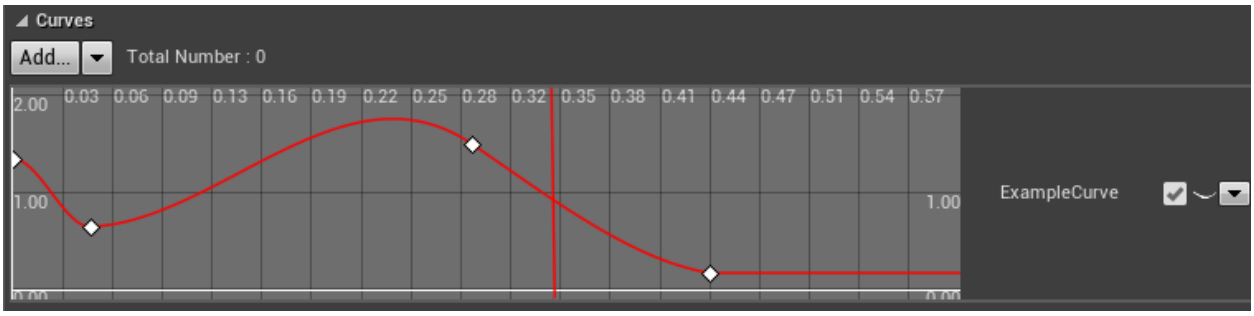

Speed
[375.00]
Parameters
X Axis Label
Speed
X Axis Range
0
-
375
X Axis Divisions
4
Apply Parameter Changes
Samples
To replace sample, you can drag animation onto the sample point in the BlendSpace from Asset Browser or replace in the list below
1]ThirdPersonIdle
2]ThirdPersonWalk
0.000
Previewing
Speed [0]
ThirdPersonIdle (1.0000)
Enable Preview BlendSpace
Enable Tooltip Display
Display editor vertically
Speed
[0.00]

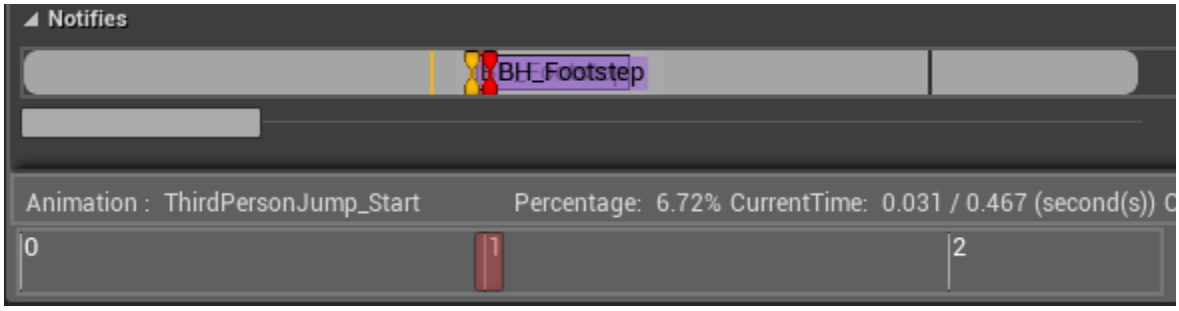

Speed
BH_Idle_Run_BS1D
Blendspace Player
Speed
Final Animation Pose
Result

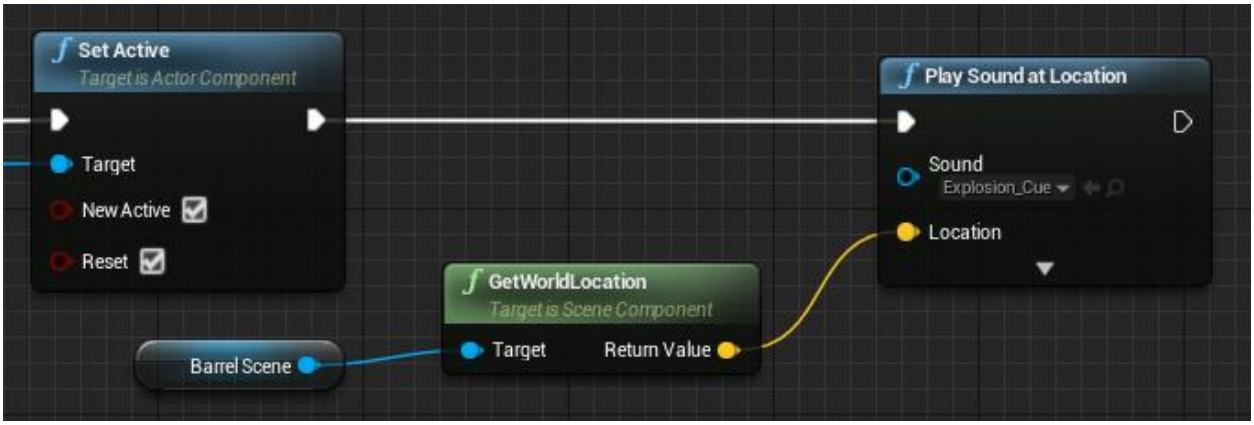

Event Blueprint Update Animation
Delta Time X
IsValid
Exec
Is Valid
Input Object
Is Not Valid
SET
Is in Air?
SET
Speed
Try Get Pawn Owner
Target is Anim Instance
Target self
Return Value
Get Movement Component
Target is Pawn
Target
Return Value
Is Falling
Target is Nav Movement Component
Target
Return Value
Get Velocity
Target is Actor
Target
Return Value
VectorLength
A
Return Value

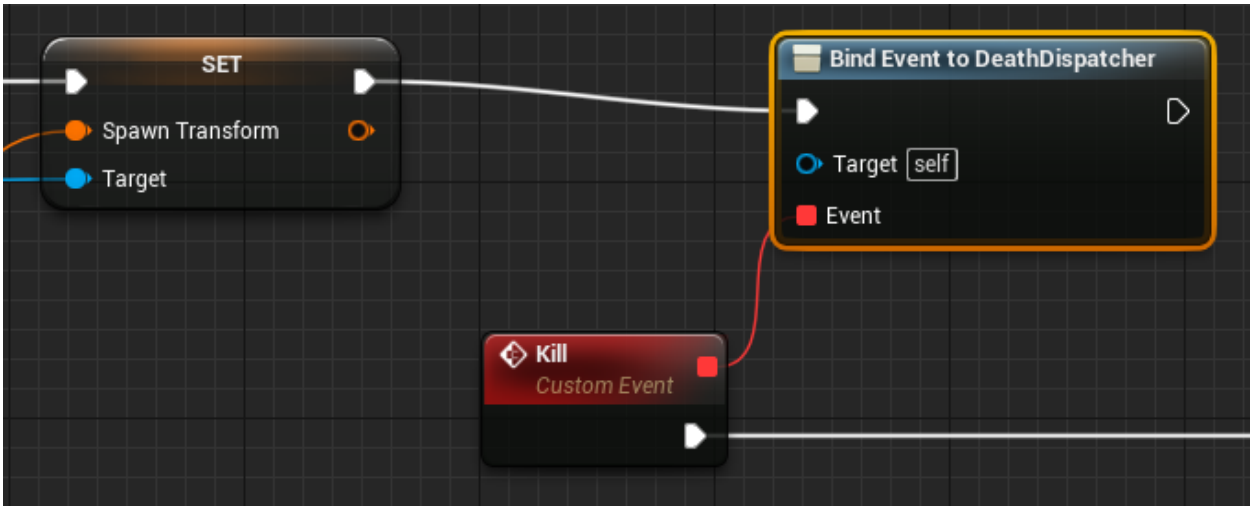
Output

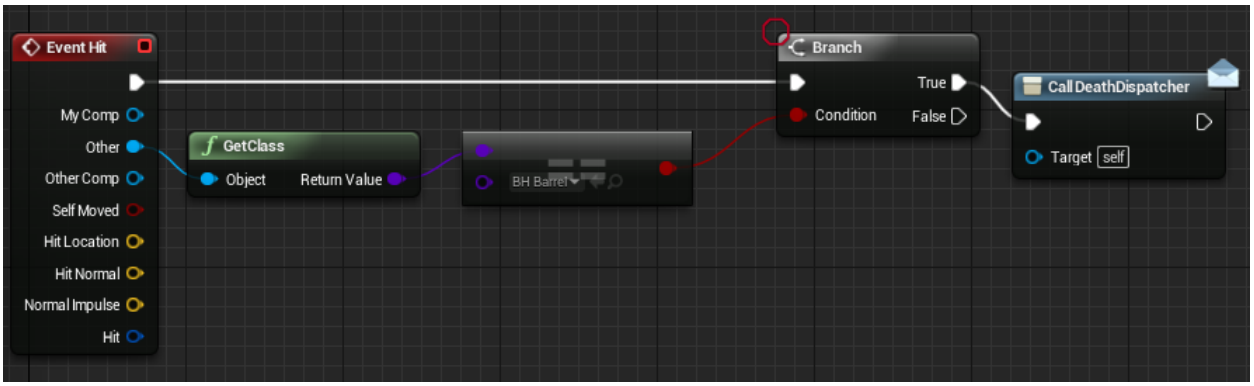

ThirdPersonRun
ThirdPersonRun
Notifies
BH_Footstep
BH_Footstep
Curves
Add...
Total Number : 0
Tracks
Additive Layer Tracks
Animation : ThirdPersonRun
Percentage: 47.04% CurrentTime: 0.282 / 0.600 (second(s)) Current Frame: 8.94 / 19 (key(s))
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

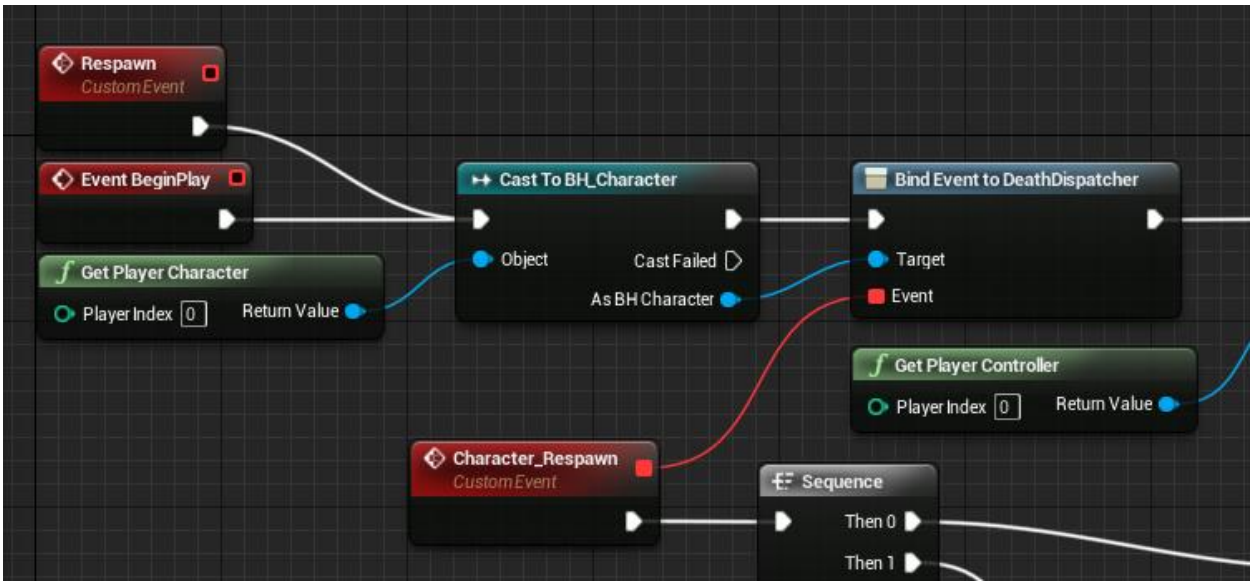

Curves
Add...
Total Number : 0
2.00
1.00
0.03 0.06 0.09 0.13 0.16 0.19 0.22 0.25 0.28 0.32 0.35 0.38 0.41 0.44 0.47 0.51 0.54 0.57
1.00
ExampleCurve

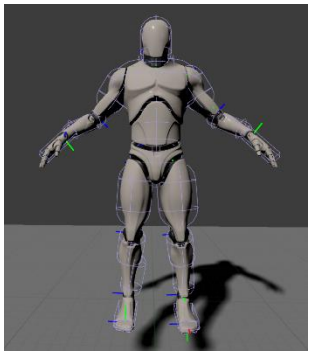

Notifies
BH_Footstep
Animation : ThirdPersonJump_Start
Percentage: 6.72% CurrentTime: 0.031 / 0.467 (second(s))
0
1
2

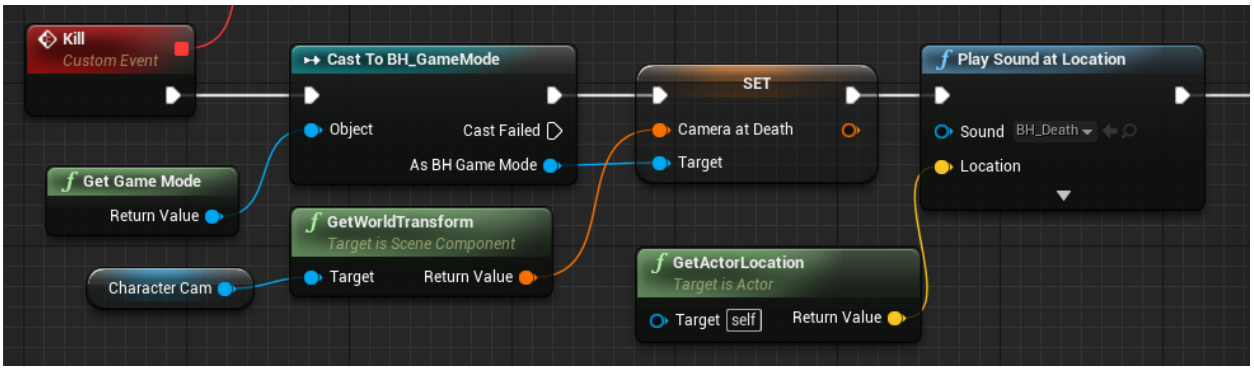

Set Active
Target is Actor Component
Target
New Active
Reset
Play Sound at Location
Sound
Explosion_Cue
Location
GetWorldLocation
Target is Scene Component
Target
Return Value
Barrel Scene

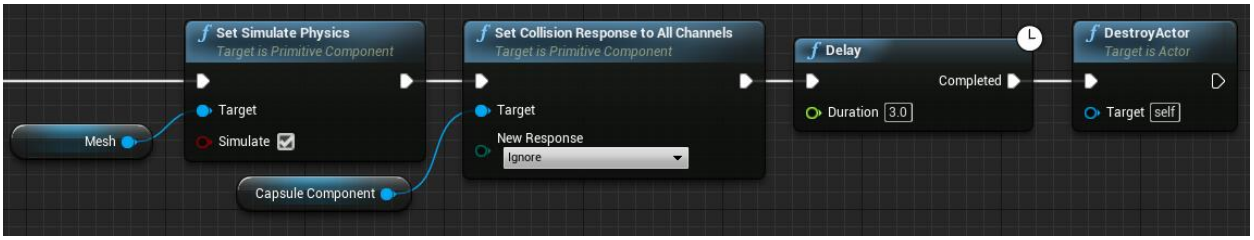

SET
Spawn Transform
Target
Bind Event to DeathDispatcher
Target self
Event
Kill
Custom Event

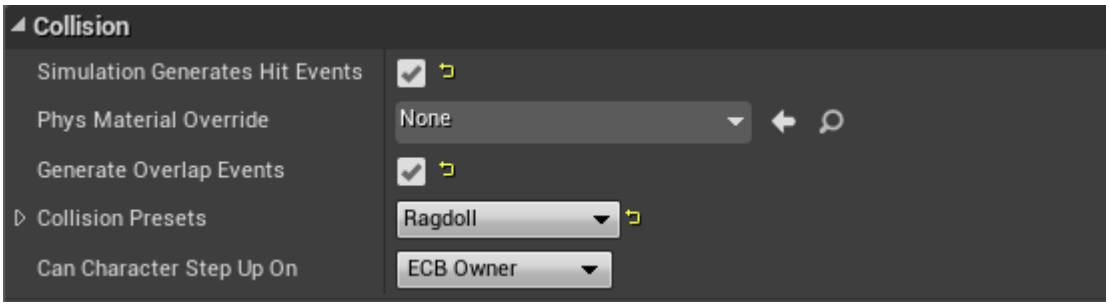

Event Hit
My Comp
Other
Other Comp
Self Moved
Hit Location
Hit Normal
Normal Impulse
Hit
GetClass
Object
Return Value
BH Barrel
Branch
Condition
True
False
Call DeathDispatcher
Target self

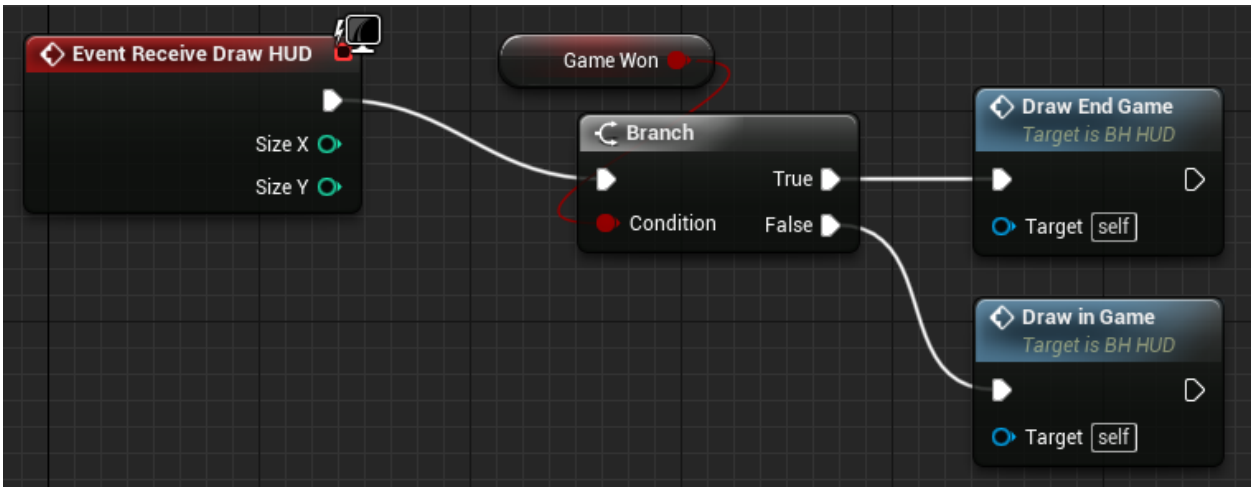

Respawn
Custom Event
Event BeginPlay
Get Player Character
Player Index 0
Return Value
Cast To BH_Character
Object
Cast Failed
As BH Character
Bind Event to DeathDispatcher
Target
Event
Get Player Controller
Player Index 0
Return Value
Character_Respawn
Custom Event
Sequence
Then 0
Then 1

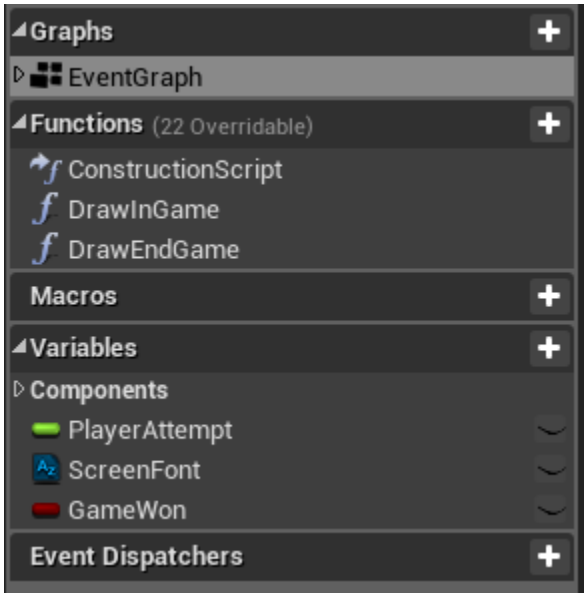


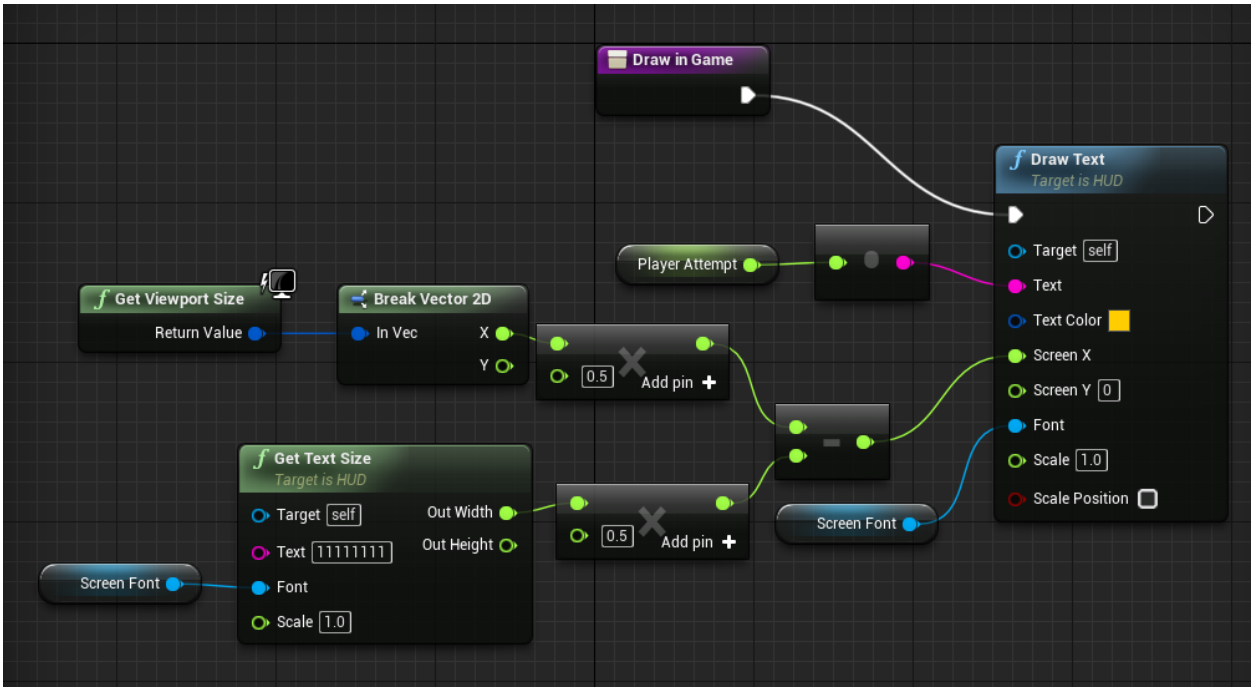

Kill
Custom Event
Cast To BH_GameMode
Object
Cast Failed
As BH Game Mode
SET
Camera at Death
Target
Play Sound at Location
Sound
BH_Death
Location
Get Game Mode
Return Value
GetWorldTransform
Target is Scene Component
Target
Return Value
Character Cam
GetActorLocation
Target is Actor
Target
self
Return Value

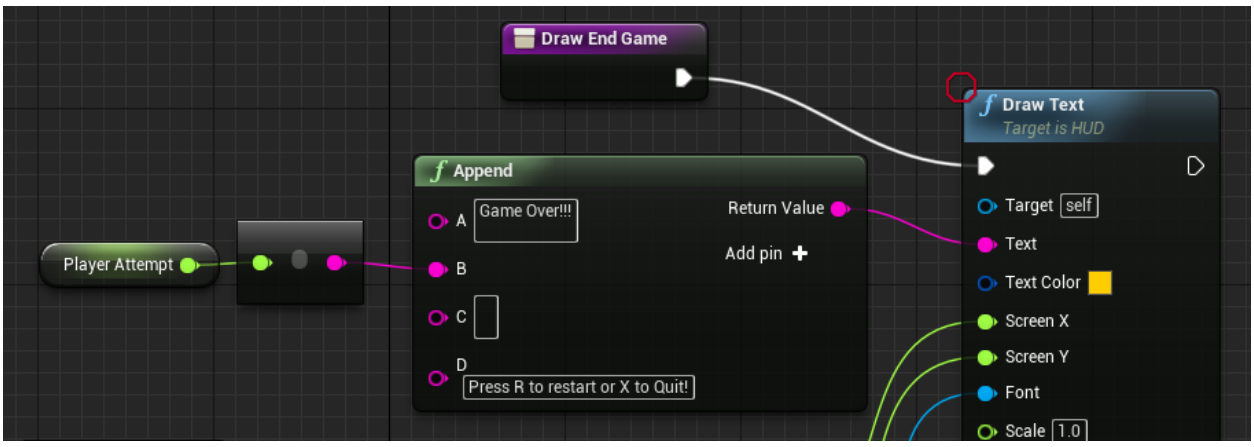

Set Simulate Physics
Target is Primitive Component
Target
Simulate
Mesh
Capsule Component
Set Collision Response to All Channels
Target is Primitive Component
Target
New Response
Ignore
Delay
Completed
Duration
3.0
DestroyActor
Target is Actor
Target
self

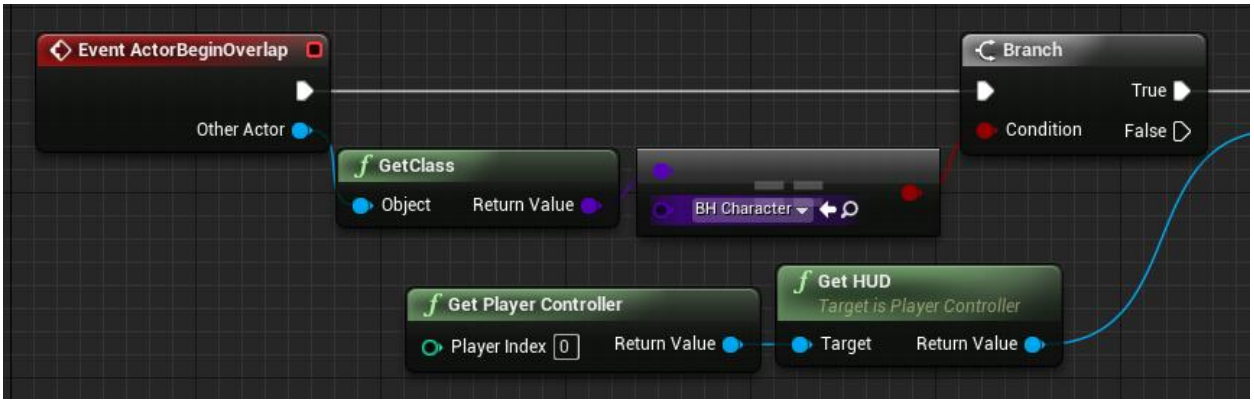

Collision
Simulation Generates Hit Events
Phys Material Override
None
Generate Overlap Events
Collision Presets
Ragdoll
Can Character Step Up On
ECB Owner

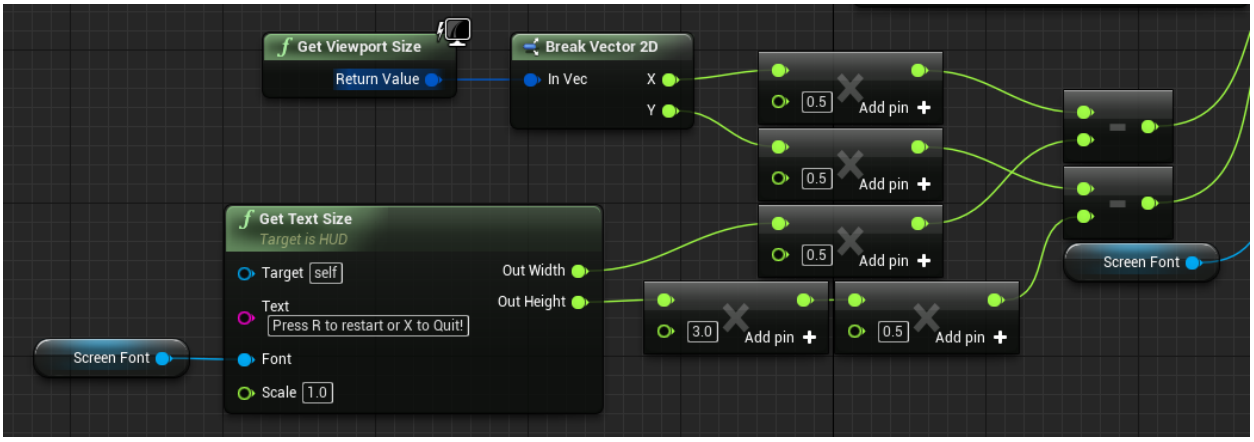

Event Receive Draw HUD
Size X
Size Y
Game Won
Branch
True
Condition
False
Draw End Game
Target is BH HUD
Target self
Draw in Game
Target is BH HUD
Target self


Graphs
EventGraph
Functions (22 Overridable)
ConstructionScript
DrawInGame
DrawEndGame
Macros
Variables
Components
PlayerAttempt
ScreenFont
GameWon
Event Dispatchers

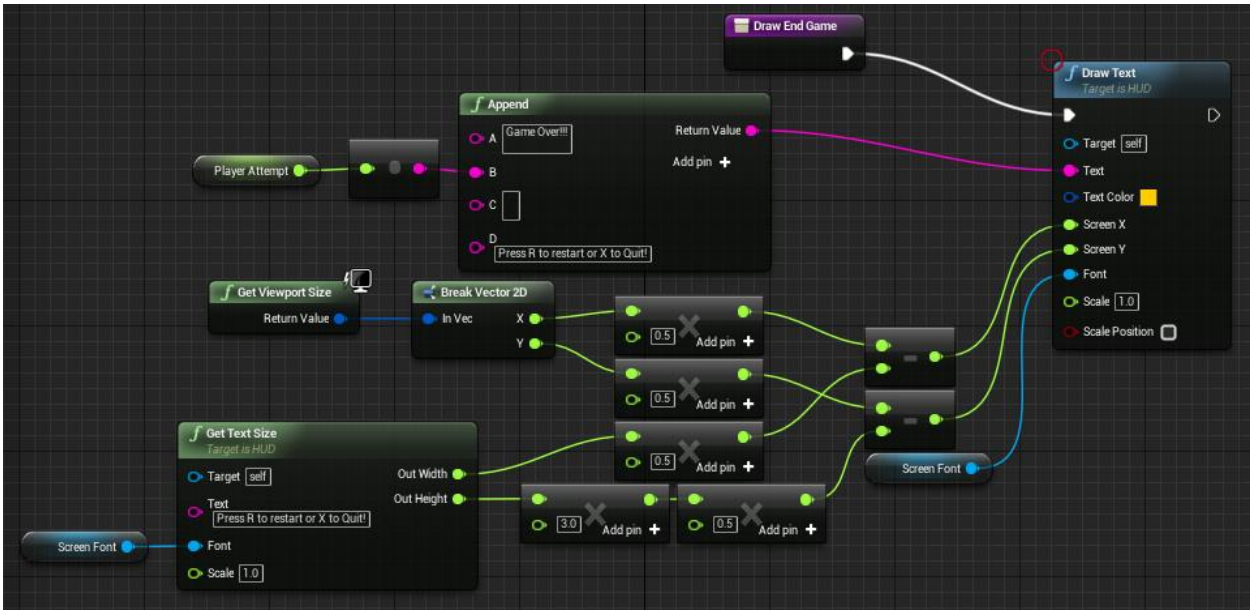

Draw in Game
Draw Text
Target is HUD
Target self
Text
Text Color
Screen X
Screen Y 0
Font
Scale 1.0
Scale Position
Player Attempt
Get Viewport Size
Return Value
Break Vector 2D
In Vec
X
Y
0.5
Add pin
Get Text Size
Target is HUD
Target self
Text 11111111
Out Width
Out Height
Font
Scale 1.0
Screen Font
Screen Font

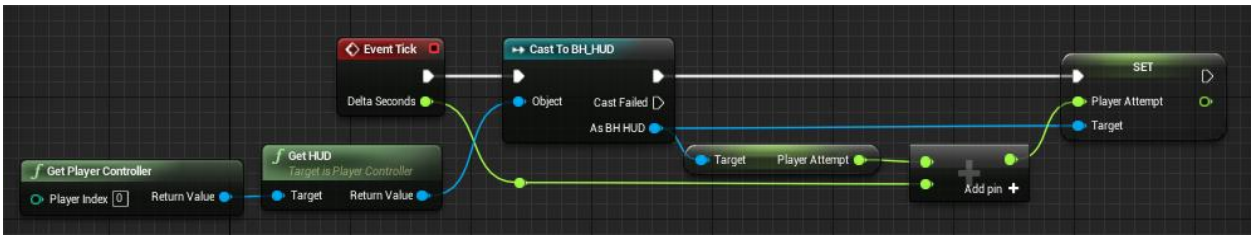

Draw End Game
Draw Text
Target is HUD
Target self
Text
Text Color
Screen X
Screen Y
Font
Scale 1.0
Append
A Game Over!!!
B
C
D Press R to restart or X to Quit!
Return Value
Add pin
Player Attempt

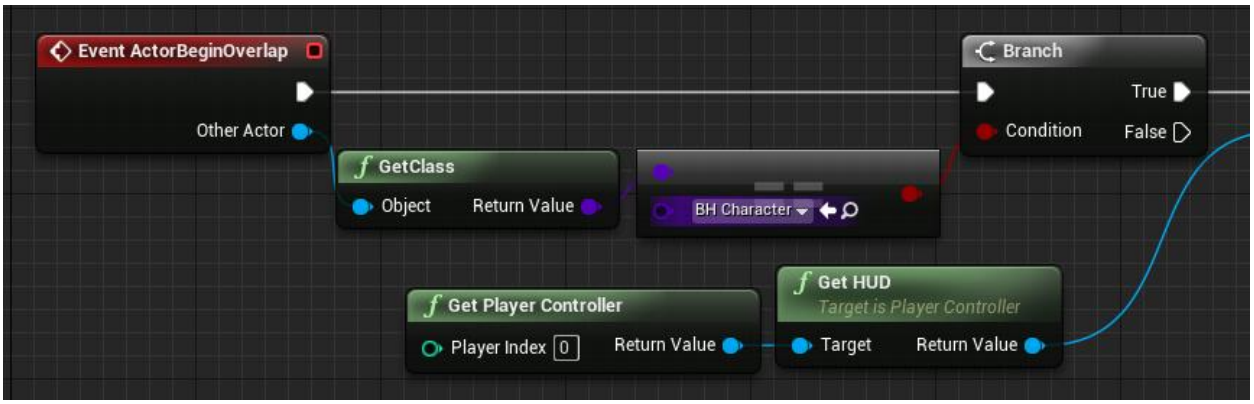

Event ActorBeginOverlap
Other Actor
Branch
True
Condition
False
GetClass
Object
Return Value
BH Character
Get Player Controller
Player Index 0
Return Value
Get HUD
Target is Player Controller
Target
Return Value


Get Viewport Size
Return Value
Break Vector 2D
In Vec
X
Y
0.5
Add pin
0.5
Add pin
0.5
Add pin
Get Text Size
Target is HUD
Target self
Text
Press R to restart or X to Quit!
Out Width
Out Height
Font
Scale 1.0
Screen Font
3.0
Add pin
0.5
Add pin
Screen Font

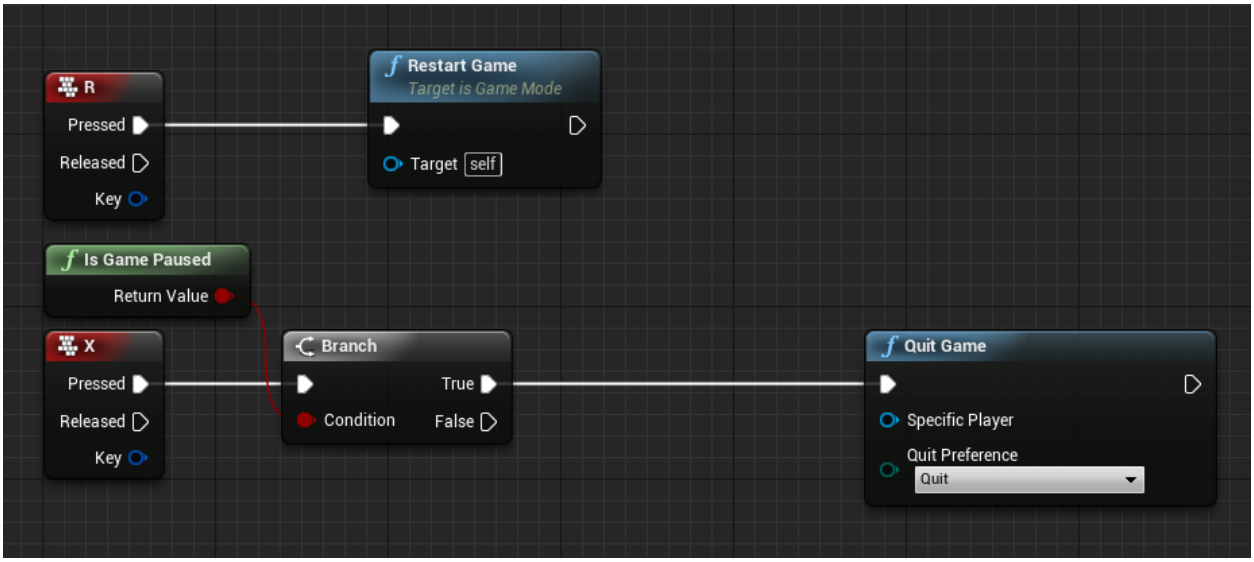
Game Over!!!
17.521936
Press R to restart or X to Quit!

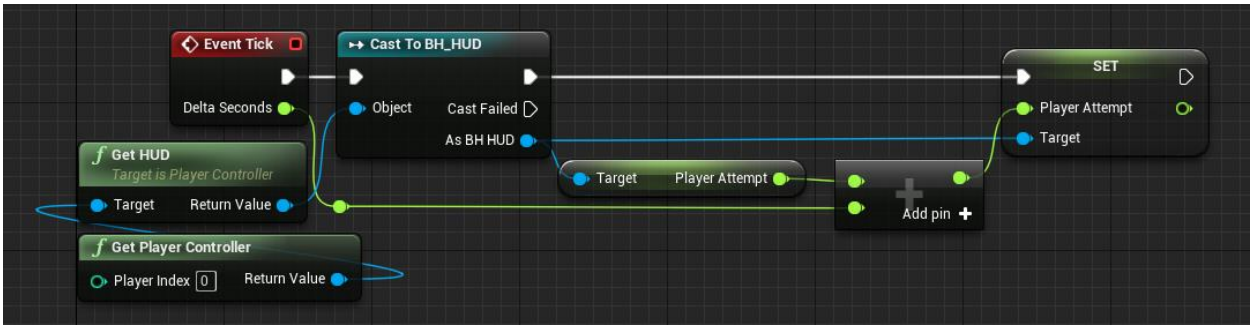

Draw End Game
Draw Text
Target is HUD
Target self
Text
Text Color
Screen X
Screen Y
Font
Scale 1.0
Scale Position
Append
A Game Over!!!
B
C
D Press R to restart or X to Quit!
Return Value
Add pin
Player Attempt
Get Viewport Size
Return Value
Break Vector 2D
In Vec
X
Y
0.5
Add pin
Get Text Size
Target is HUD
Target self
Text Press R to restart or X to Quit!
Font
Scale 1.0
Out Width
Out Height
Screen Font
3.0
0.5

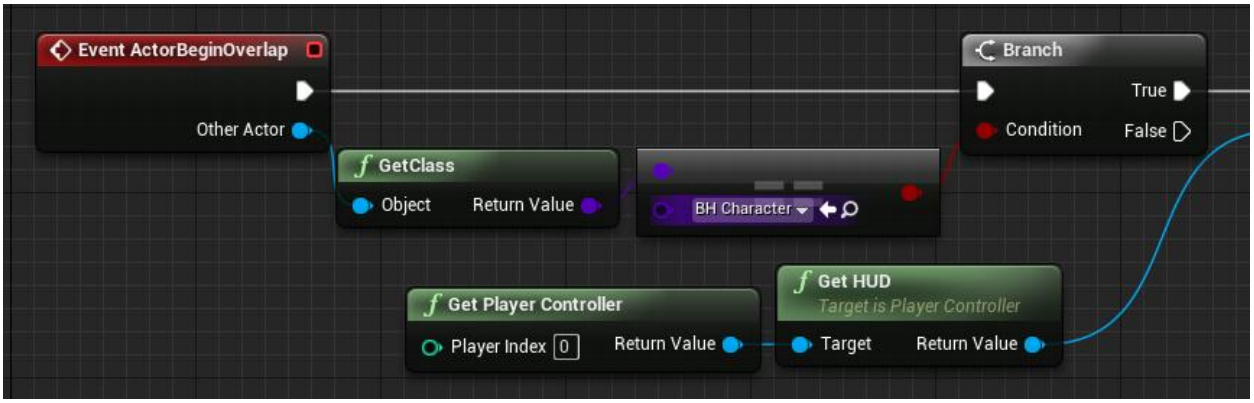

Event Tick
Delta Seconds
Cast To BH_HUD
Object
Cast Failed
As BH HUD
SET
Player Attempt
Target
Get Player Controller
Player Index 0
Return Value
Get HUD
Target is Player Controller
Target
Return Value
Target
Player Attempt
Add pin

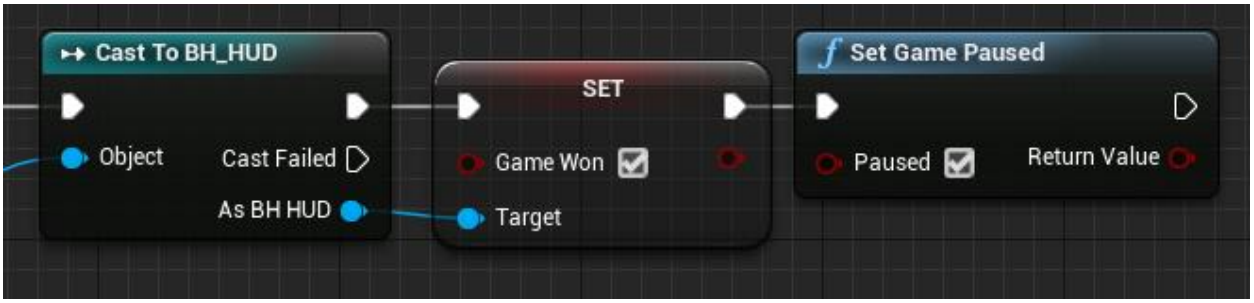

Event ActorBeginOverlap
Other Actor
Branch
True
Condition
False
GetClass
Object
Return Value
BH Character
Get Player Controller
Player Index 0
Return Value
Get HUD
Target is Player Controller
Target
Return Value

Cast To BH_HUD
Object
Cast Failed
As BH HUD
SET
Game Won
Target
Set Game Paused
Paused
Return Value

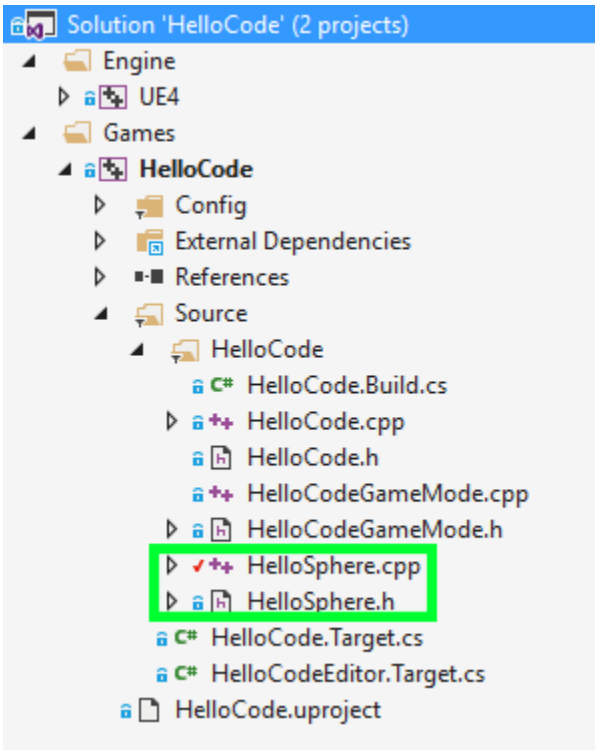

R
Pressed
Released
Key
Restart Game
Target is Game Mode
Target self
Is Game Paused
Return Value
X
Pressed
Released
Key
Branch
Condition
True
False
Quit Game
Specific Player
Quit Preference
Quit

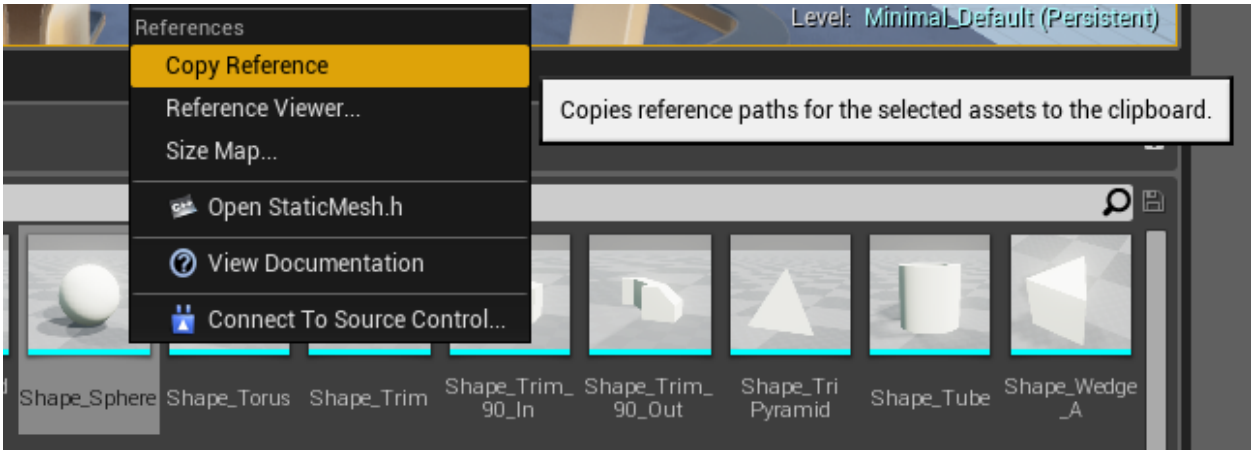

Event Tick
Delta Seconds
Cast To BH_HUD
Object
Cast Failed
As BH HUD
SET
Player Attempt
Target
Get HUD
Target is Player Controller
Target
Return Value
Target
Player Attempt
Add pin
Get Player Controller
Player Index 0
Return Value


Event ActorBeginOverlap
Other Actor
GetClass
Object
Return Value
BH Character
Branch
True
Condition
False
Get Player Controller
Player Index 0
Return Value
Get HUD
Target is Player Controller
Target
Return Value

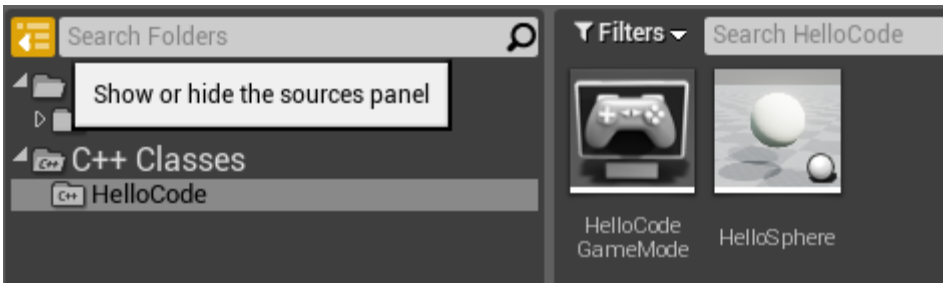

Cast To BH_HUD
Object
Cast Failed
As BH HUD
SET
Game Won
Target
Set Game Paused
Paused
Return Value

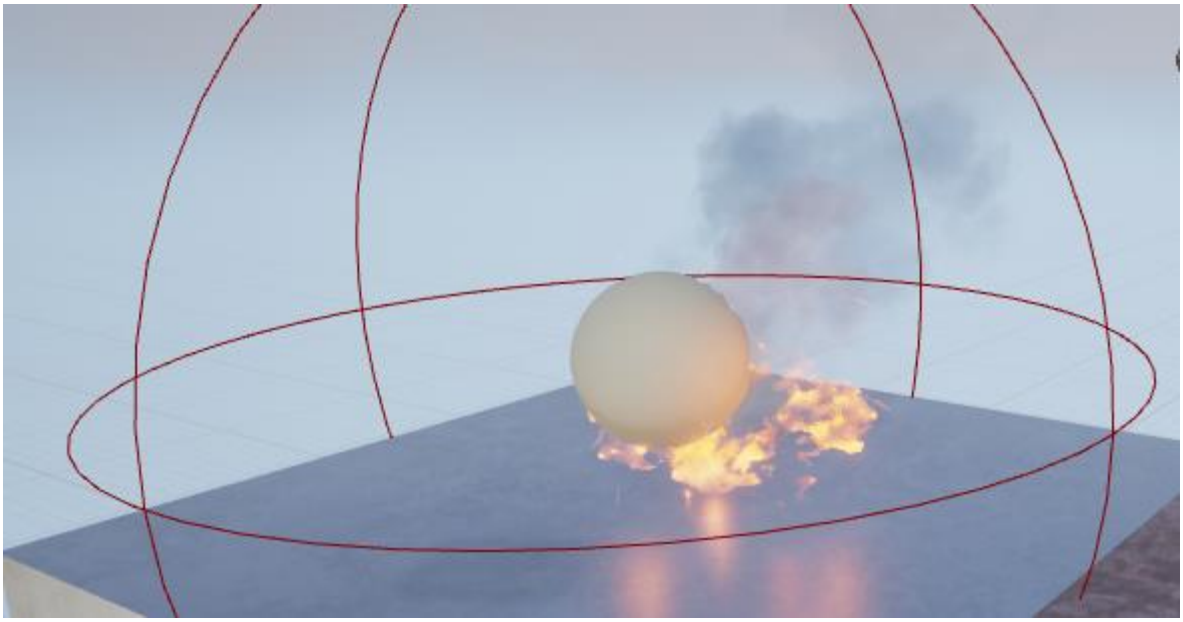
Chapter 4: Unreal Engine, C++, and You



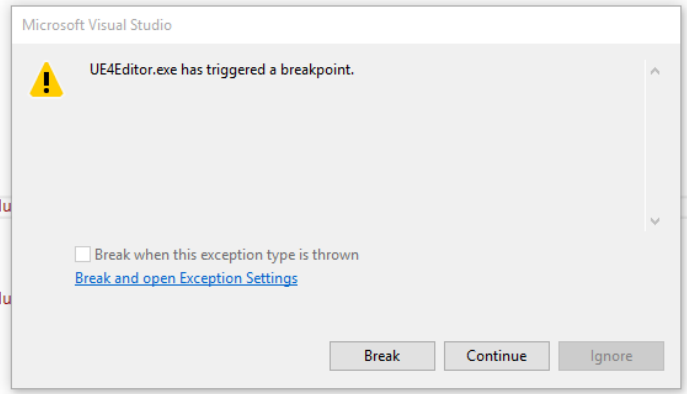

References
Copy Reference
Reference Viewer...
Size Map...
Open StaticMesh.h
View Documentation
Connect To Source Control...
Copies reference paths for the selected assets to the clipboard.
Level: Minimal_Default (Persistent)
Shape_Sphere
Shape_Torus
Shape_Trim
Shape_Trim_ 90_In
Shape_Trim_ 90_Out
Shape_Tri Pyramid
Shape_Tube
Shape_Wedge _A

Development Edito
Win64
Local Windows Debugger

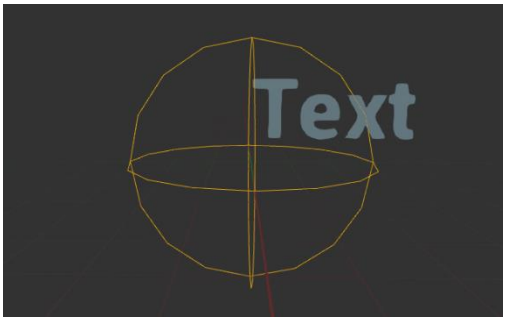

Search Folders
Show or hide the sources panel
C++ Classes
HelloCode
Filters
Search HelloCode
HelloCode GameMode
HelloSphere

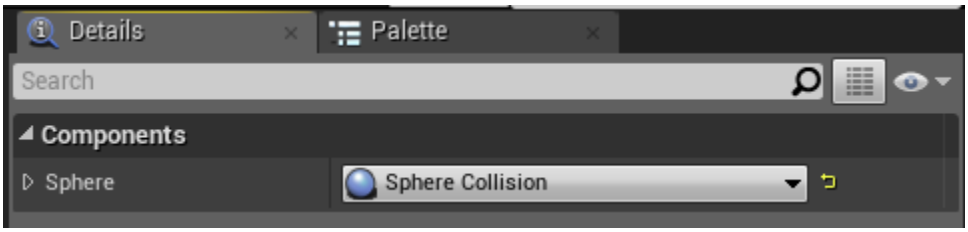


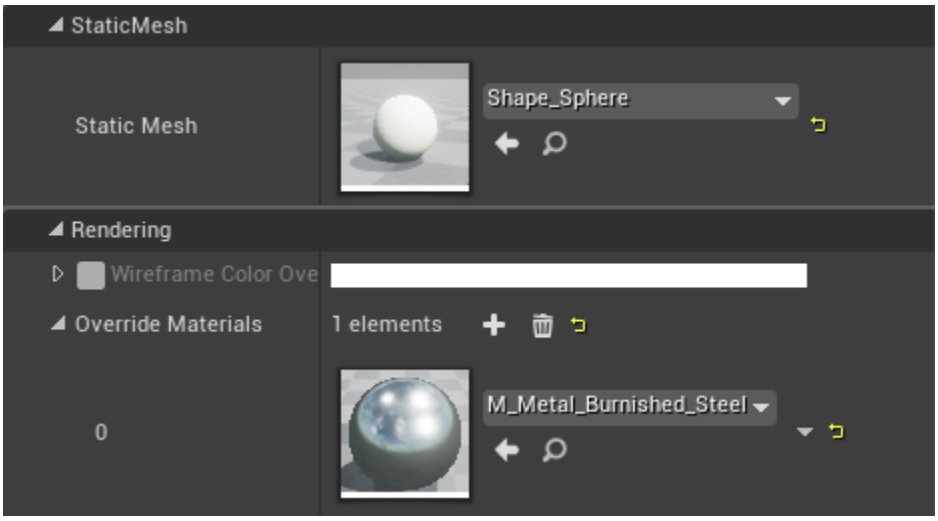
```
ExtraBlueprintInfo),
GetPathName())));


esn't match
= IsTemplate())

e())

TEXT("Template Mismatch du                                                    Parent '%s' Self '%s'"), *Parent-

TEXT("Template Mismatch du                                                    Parent '%s' Self '%s'"), *Parent-


aps() when detaching, since we are going to do it anyway after we reattach below.
Fit this also maintains correct behavior when we don't have KeepWorldPosition set.
etachmentUpdateOverlaps = bDisableDetachmentUpdateOverlaps;
```

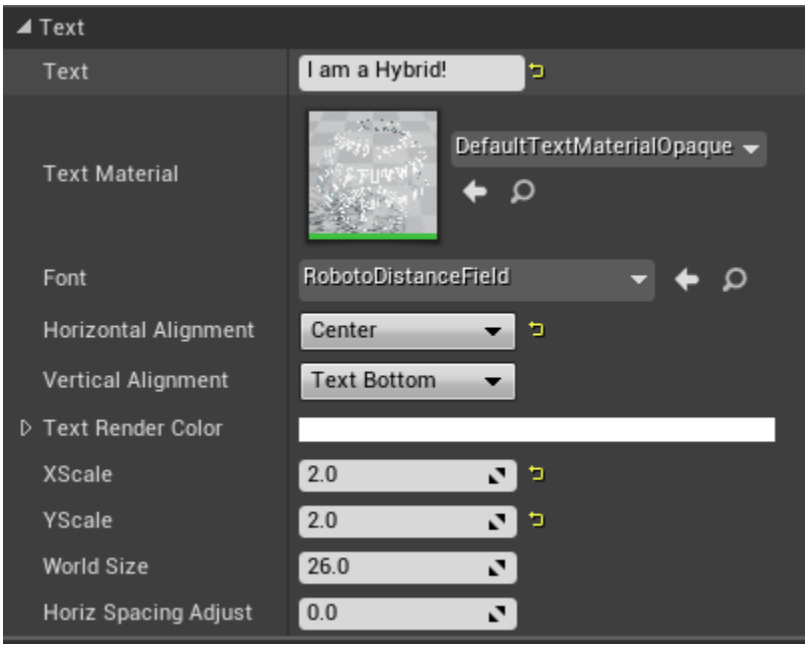


HelloWorld

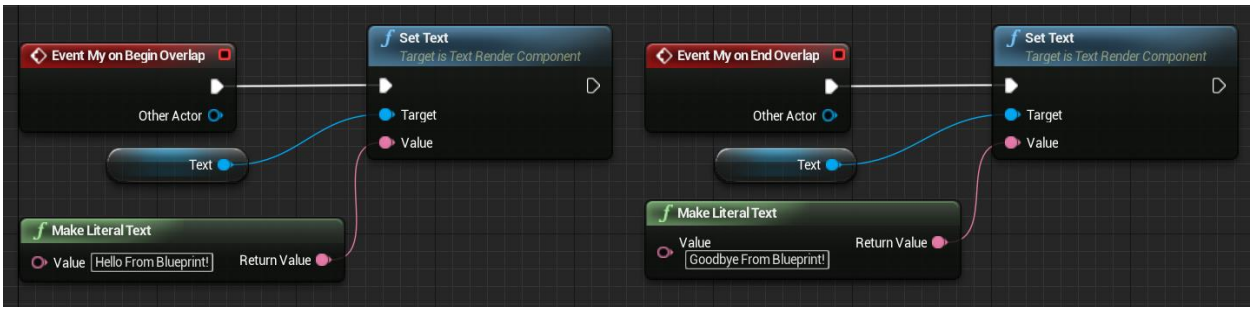

Text

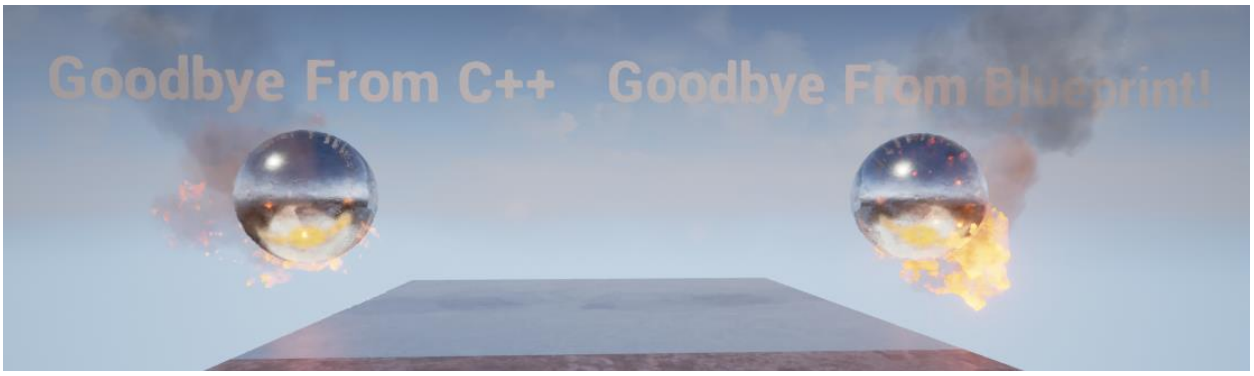

Details
Palette
Search
Components
Sphere
Sphere Collision


StaticMesh
Static Mesh
Shape_Sphere
Rendering
Wireframe Color Ove
Override Materials
1 elements
0
M_Metal_Burnished_Steel

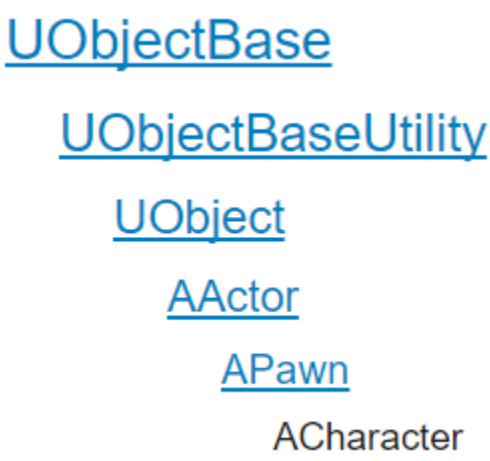

Text
Text
I am a Hybrid!
Text Material
DefaultTextMaterialOpaque
Font
RobotoDistanceField
Horizontal Alignment
Center
Vertical Alignment
Text Bottom
Text Render Color
XScale
2.0
YScale
2.0
World Size
26.0
Horiz Spacing Adjust
0.0

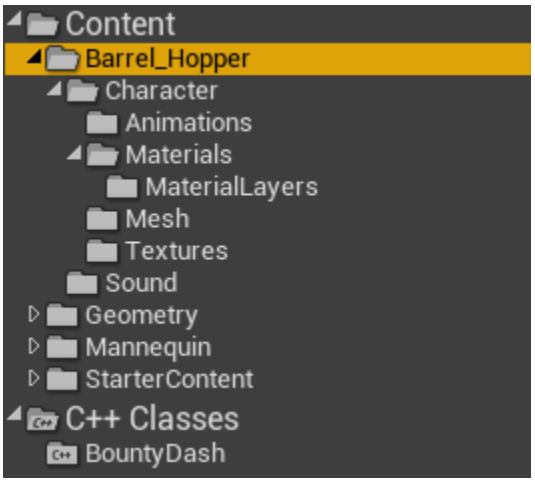
Text

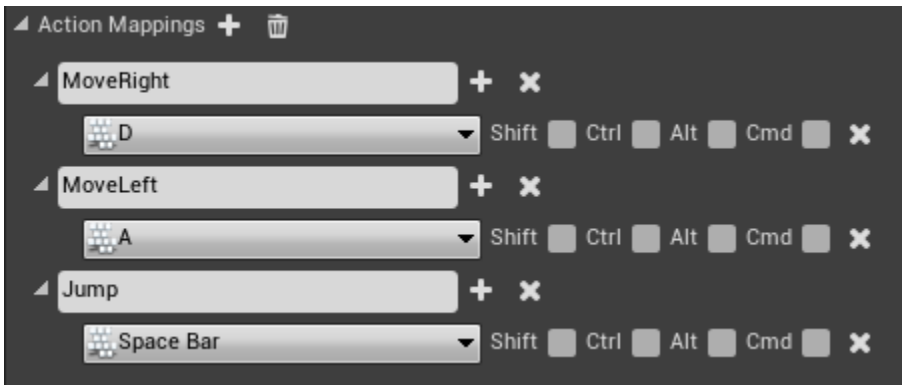

Event My on Begin Overlap
Other Actor
Text
Make Literal Text
Value
Hello From Blueprint!
Return Value
Set Text
Target is Text Render Component
Target
Value
Event My on End Overlap
Other Actor
Text
Make Literal Text
Value
Goodbye From Blueprint!
Return Value
Set Text
Target is Text Render Component
Target
Value

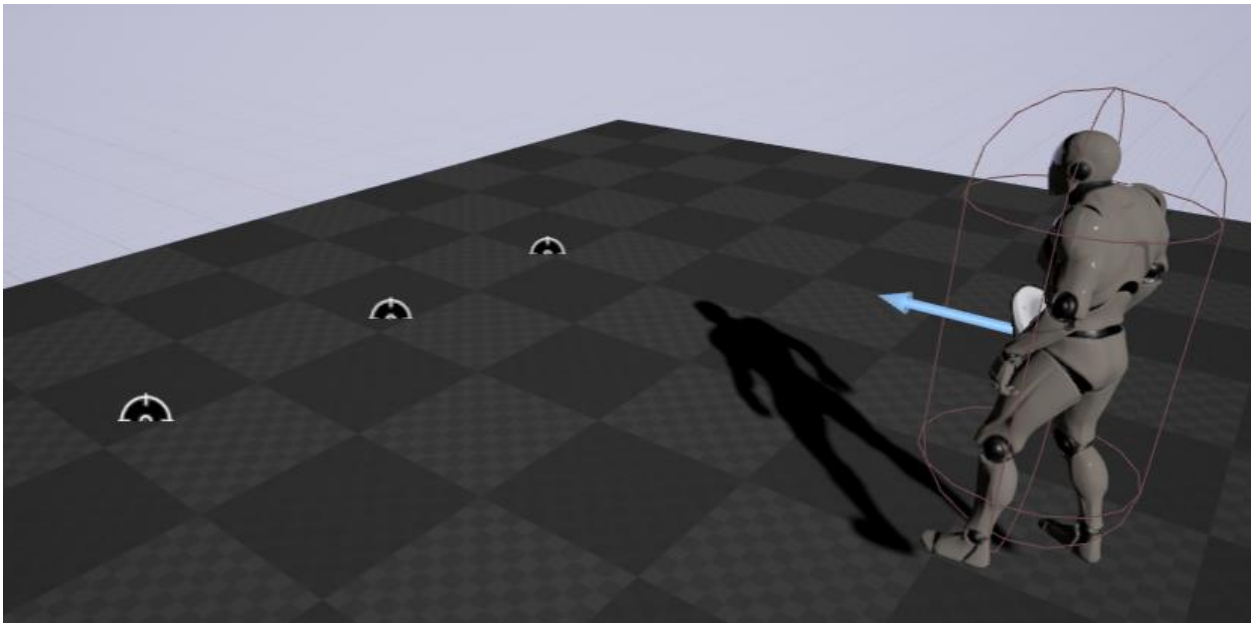

Goodbye From C++
Goodbye From Blueprint!

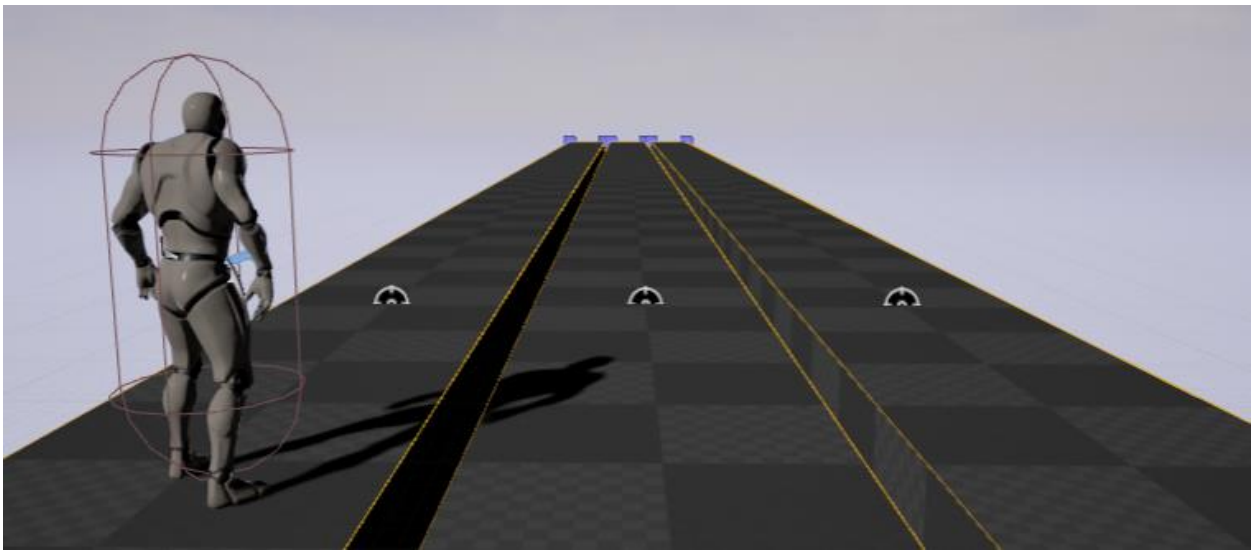
Chapter 5: Upgrade Activated – Making Bounty Dash with C++

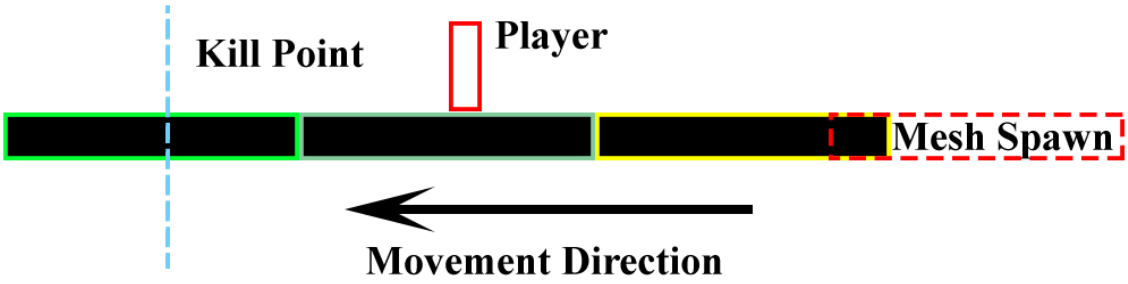


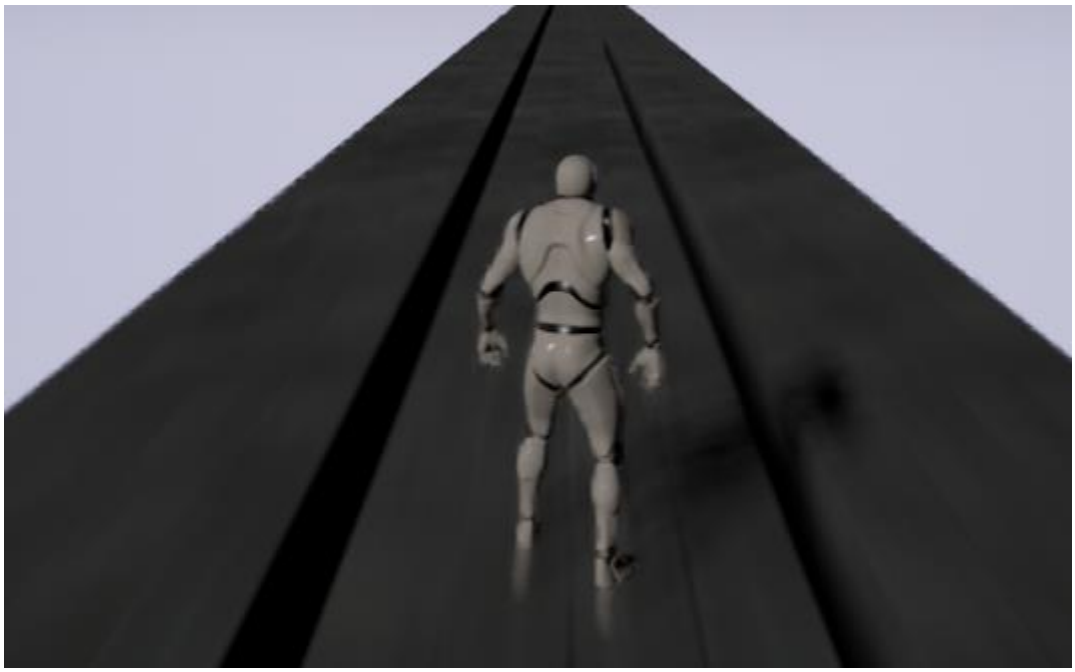




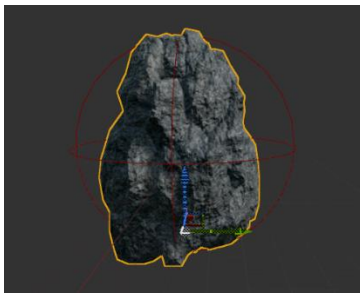


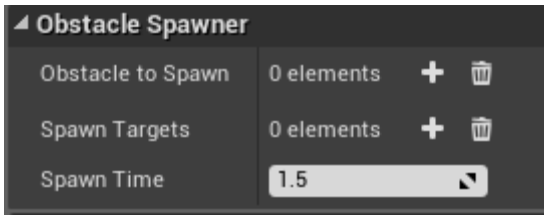


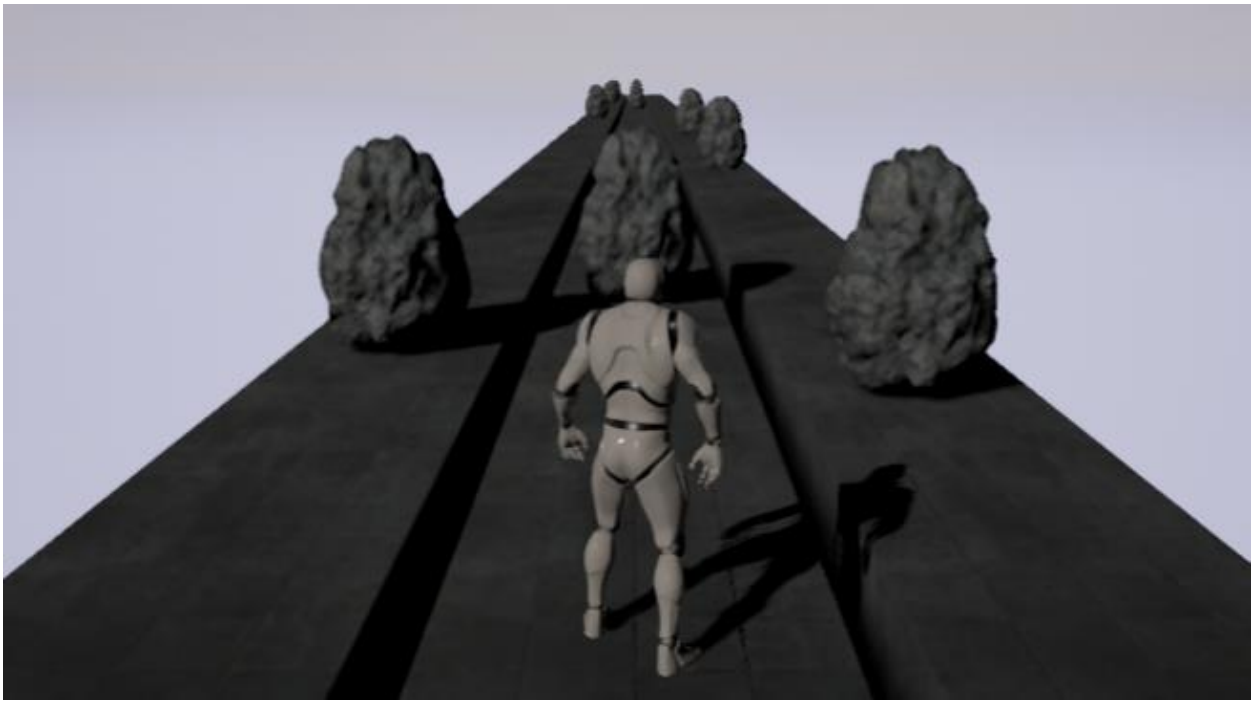

Kill Point
Player
Mesh Spawn
Movement Direction



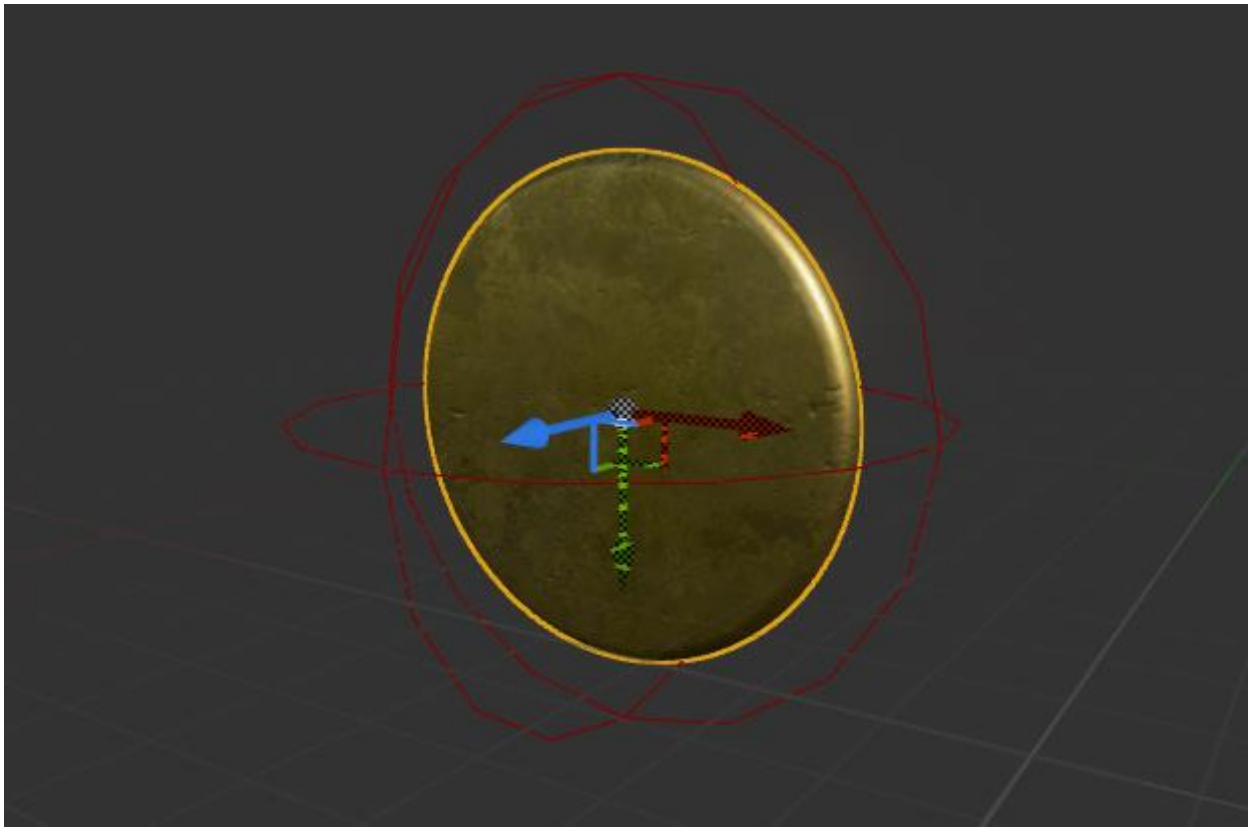
Transform
Absolute Location
Absolute Rotation
Absolute Scale
Relative Location
X 0.0
Y 0.0
Z -80.0
Relative Rotation
Roll 0.0
Pitch 0.0
Yaw 0.0
Relative Scale 3D
X 0.93895
Y 0.586182
Z 0.696594



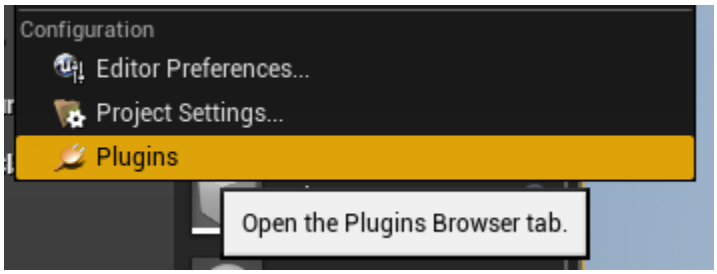

Obstacle Spawner
Obstacle to Spawn
0 elements
Spawn Targets
0 elements
Spawn Time
1.5

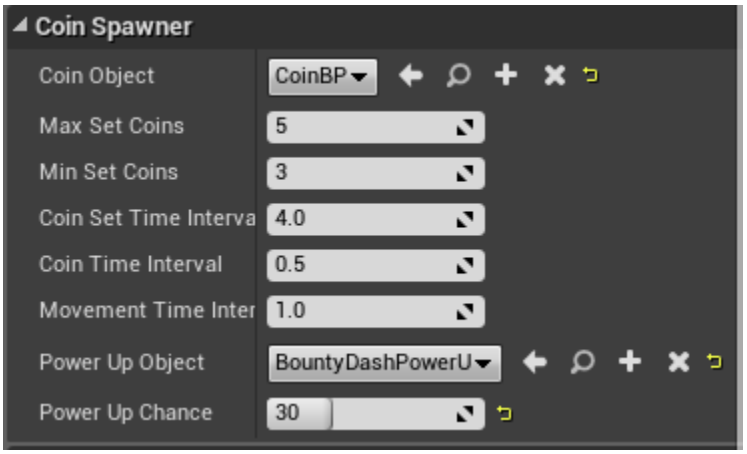


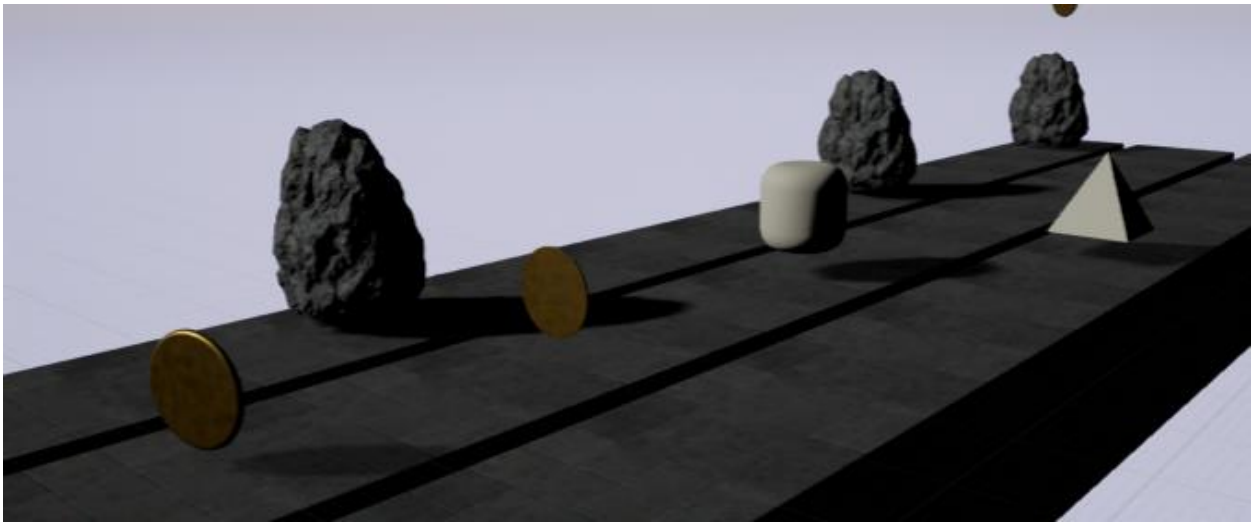
Transform
Absolute Location
Absolute Rotation
Absolute Scale
Relative Location
X 0.0
Y 0.0
Z 0.0
Relative Rotation
Roll 90.0
Pitch 0.0
Yaw 90.0
Relative Scale 3D
X 0.47
Y 0.47
Z 0.47



Chapter 6: Power Ups for Your Character, Power Ups for the User

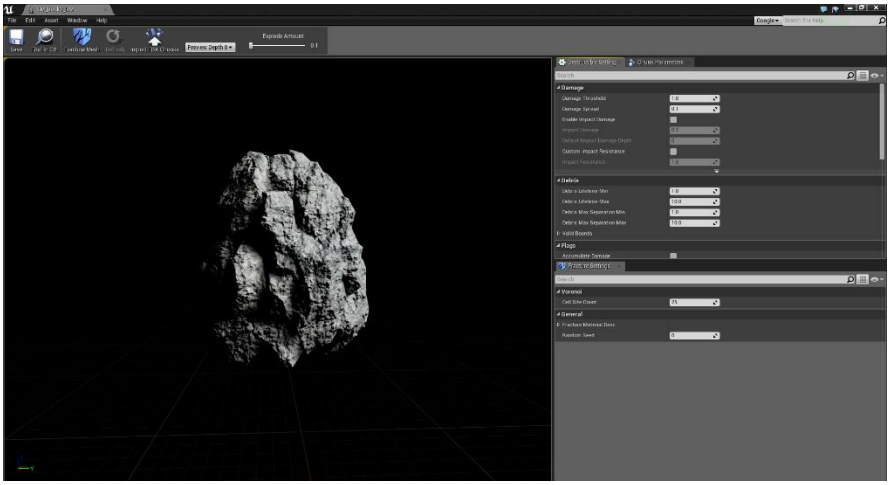




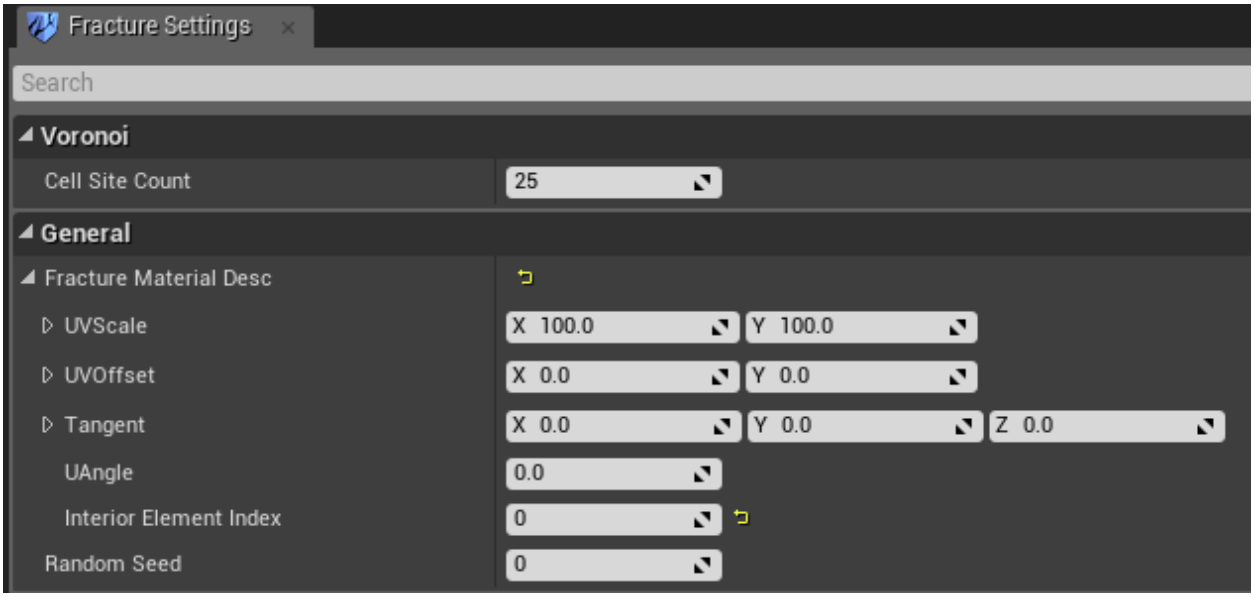


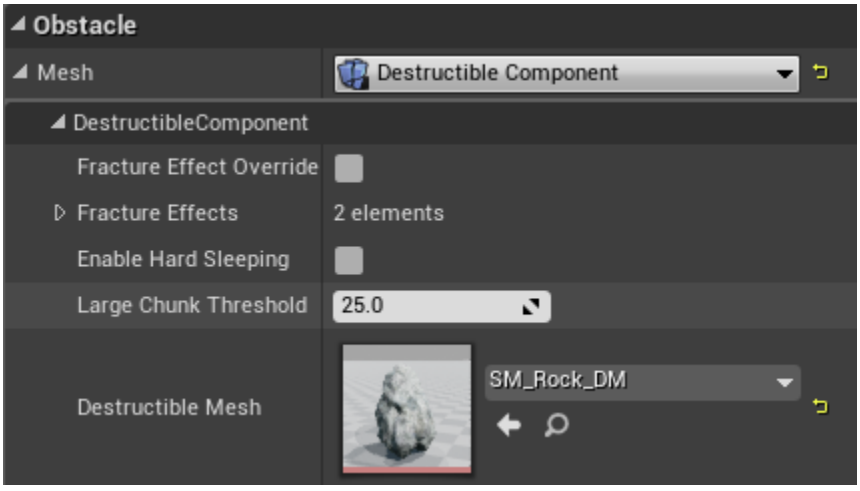
SM_Rock

Static Mesh Actions
Create Destructible Mesh
Import LOD
Imported Asset
Creates a DestructibleMesh from the StaticMesh and opens it in the DestructibleMesh editor.

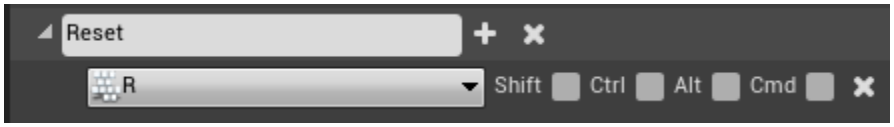


Damage
Damage Threshold
1.0
Damage Spread
0.1
Enable Impact Damage
Impact Damage
5.5
Default Impact Damage Depth
0
Custom Impact Resistance
Impact Resistance
1.0

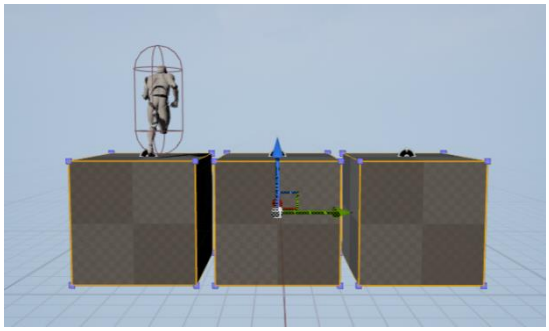

Fracture Settings
Search
Voronoi
Cell Site Count
25
General
Fracture Material Desc
UVScale
X 100.0
Y 100.0
UVOffset
X 0.0
Y 0.0
Tangent
X 0.0
Y 0.0
Z 0.0
UAngle
0.0
Interior Element Index
0
Random Seed
0

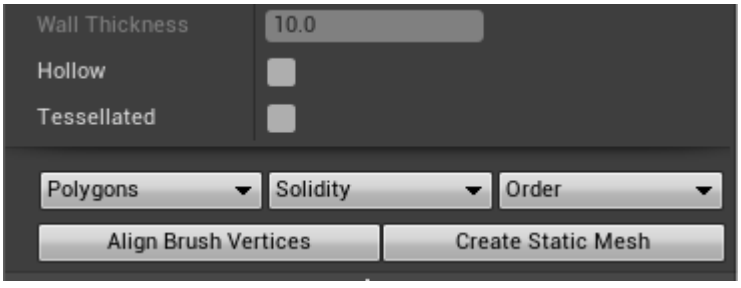

Obstacle
Mesh
Destructible Component
DestructibleComponent
Fracture Effect Override
Fracture Effects
2 elements
Enable Hard Sleeping
Large Chunk Threshold
25.0
Destructible Mesh
SM_Rock_DM

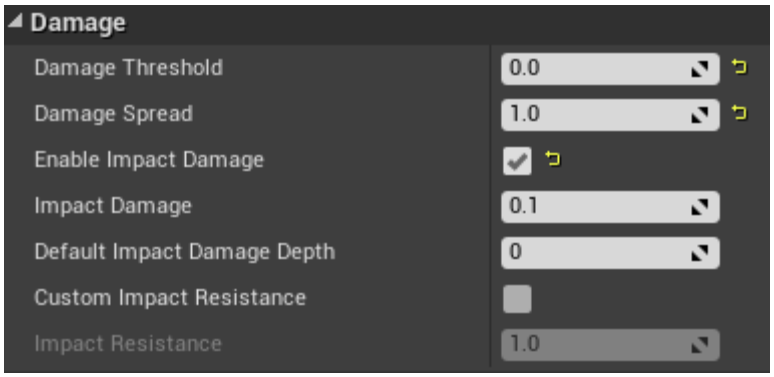
Score: 0 Runtime: 16.5932


Reset
R
Shift
Ctrl
Alt
Cmd

GAME OVER!! Press R to Restart!

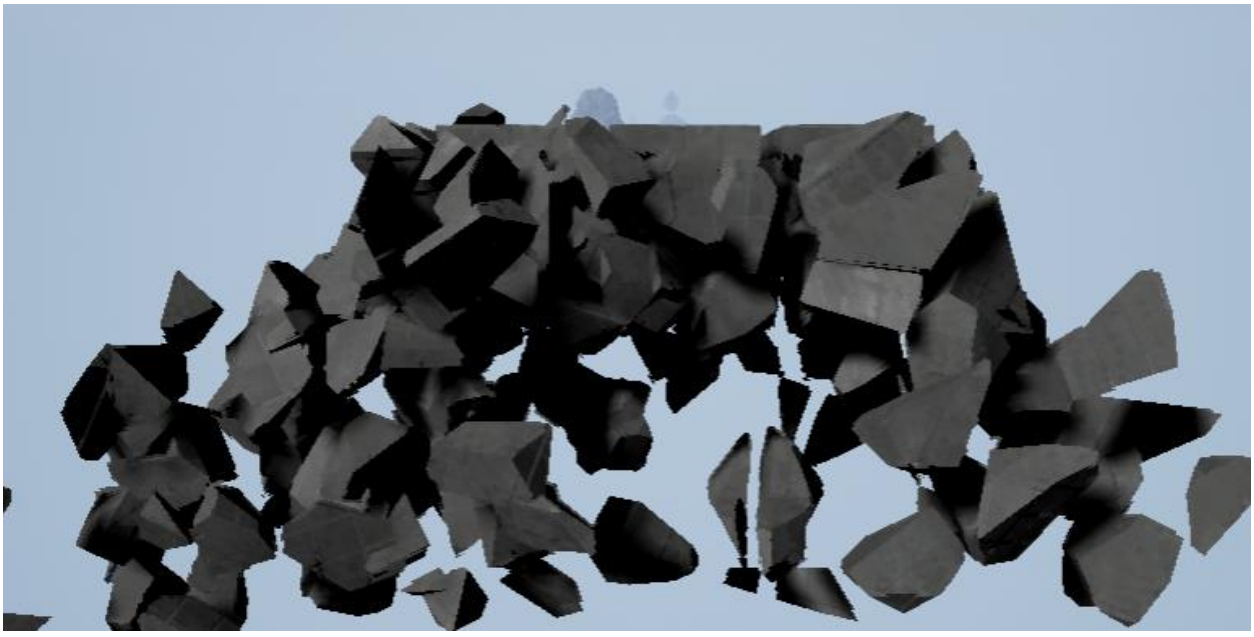



Wall Thickness
10.0
Hollow
Tessellated
Polygons
Solidity
Order
Align Brush Vertices
Create Static Mesh

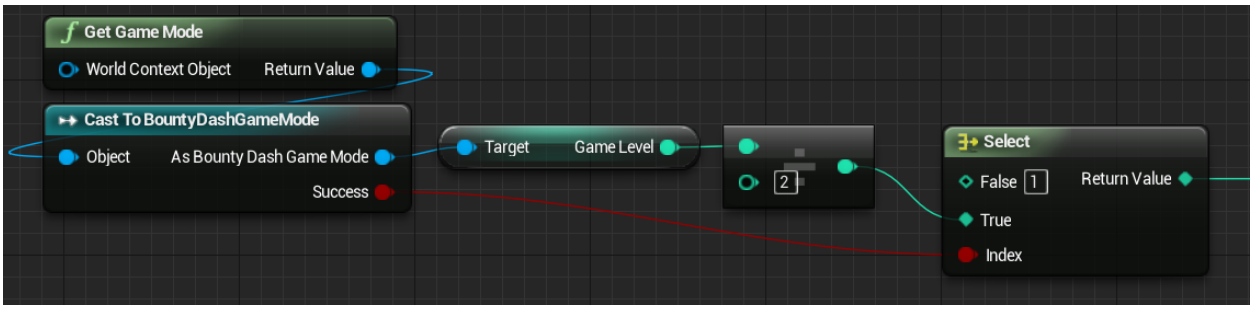

Damage
Damage Threshold
0.0
Damage Spread
1.0
Enable Impact Damage
Impact Damage
0.1
Default Impact Damage Depth
0
Custom Impact Resistance
Impact Resistance
1.0

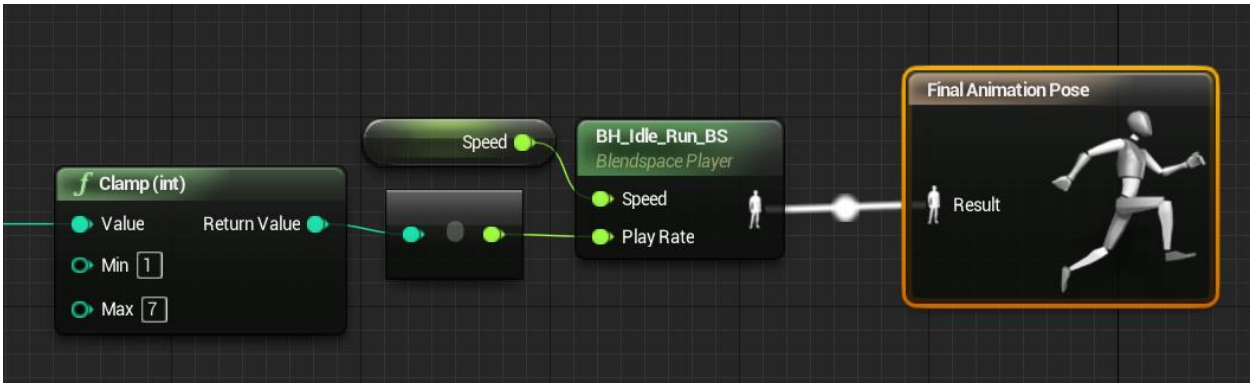
Debris
Debris Lifetime Min
2.0
Debris Lifetime Max
10.0
Debris Max Separation Min
1.0
Debris Max Separation Max
10.0
Valid Bounds

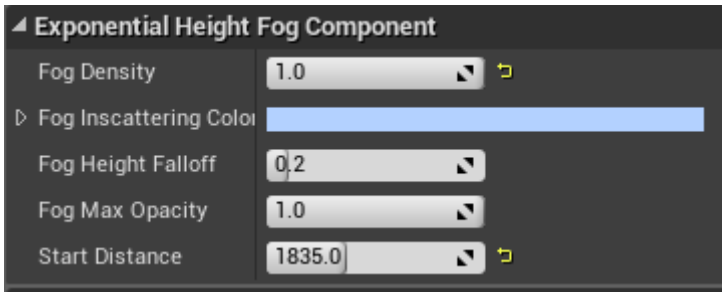
Voronoi
Cell Site Count
50
General
Fracture Material Desc
UVScale
X 100.0
Y 100.0
UVOffset
X 0.0
Y 0.0
Tangent
X 0.0
Y 0.0
Z 0.0
UAngle
0.0
Interior Element Index
0
Random Seed
0



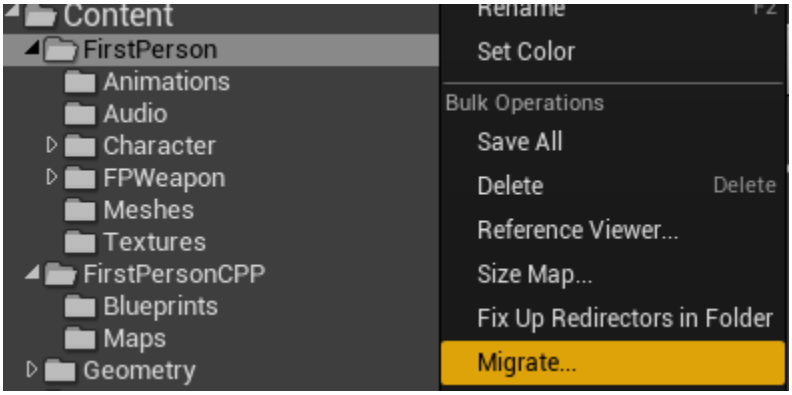
SET
Is in Air?
SET
Speed
600


Get Game Mode
World Context Object
Return Value
Cast To BountyDashGameMode
Object
As Bounty Dash Game Mode
Success
Target
Game Level
2
Select
False
1
Return Value
True
Index

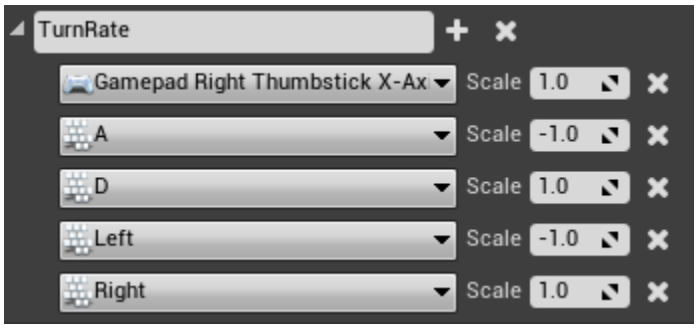

Clamp (int)
Value
Return Value
Min 1
Max 7
Speed
BH_Idle_Run_BS
Blendspace Player
Speed
Play Rate
Final Animation Pose
Result


Exponential Height Fog Component
Fog Density
1.0
Fog Inscattering Colo
Fog Height Falloff
0.2
Fog Max Opacity
1.0
Start Distance
1835.0

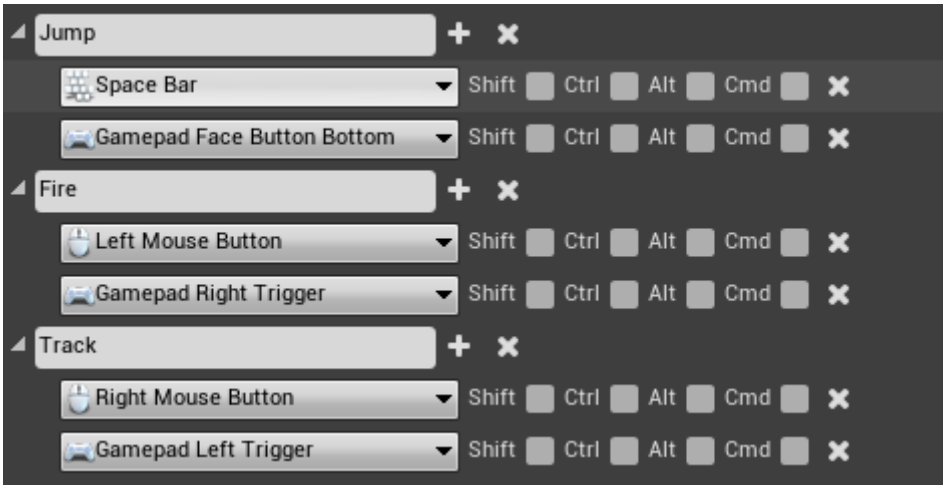
Chapter 7: Boss Mode Activated – Unreal Robots

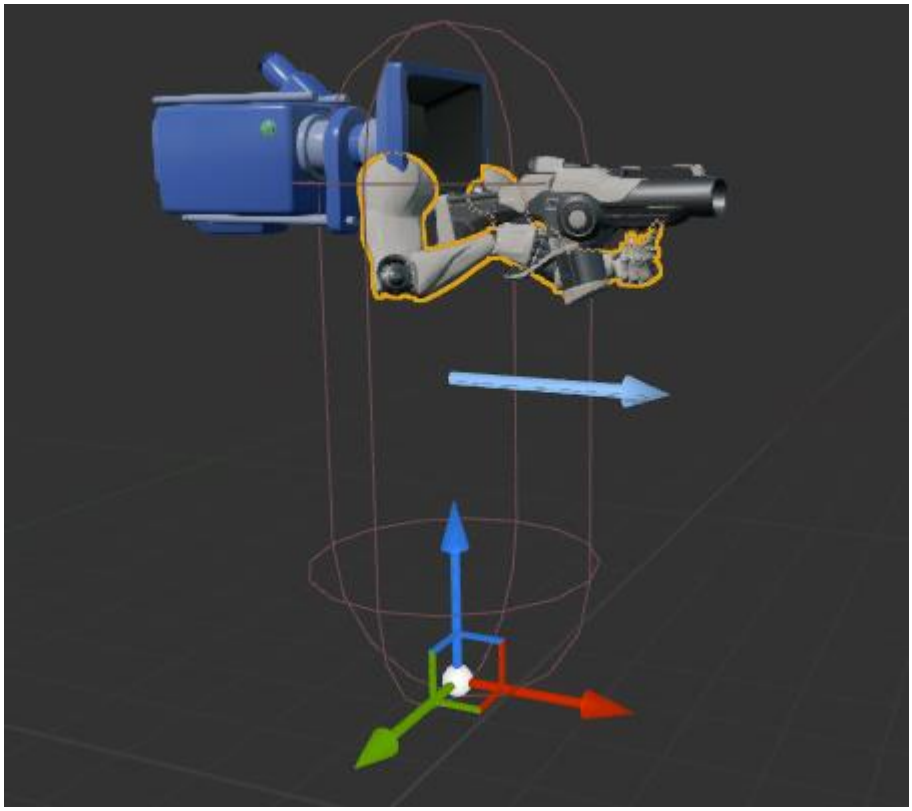


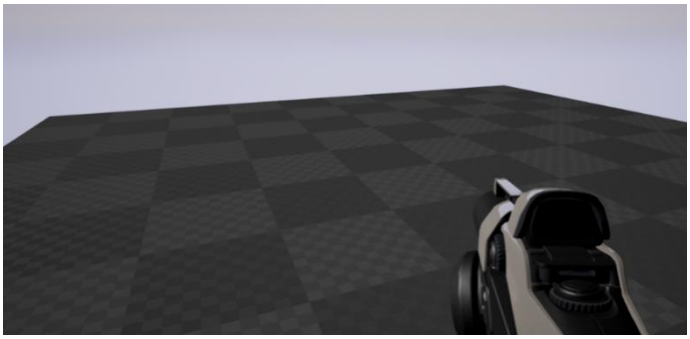
MoveForward
W
Scale 1.0
S
Scale -1.0
Up
Scale 1.0
Down
Scale -1.0
Gamepad Left Thumbstick Y-Axis
Scale 1.0

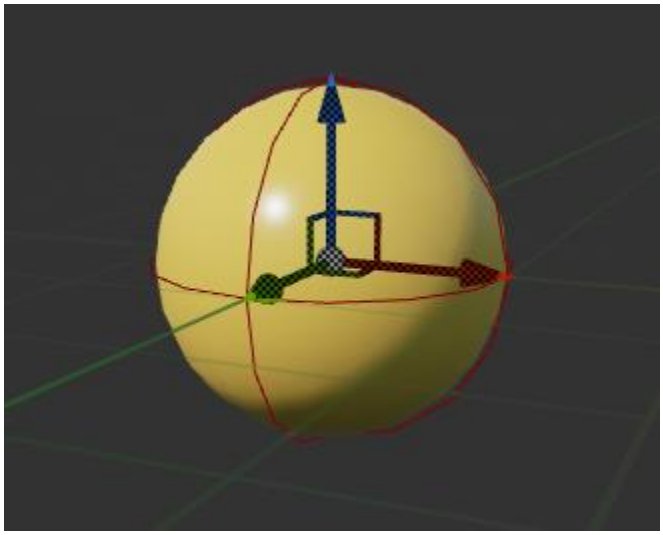

TurnRate
Gamepad Right Thumbstick X-Ax
Scale 1.0
A
Scale -1.0
D
Scale 1.0
Left
Scale -1.0
Right
Scale 1.0

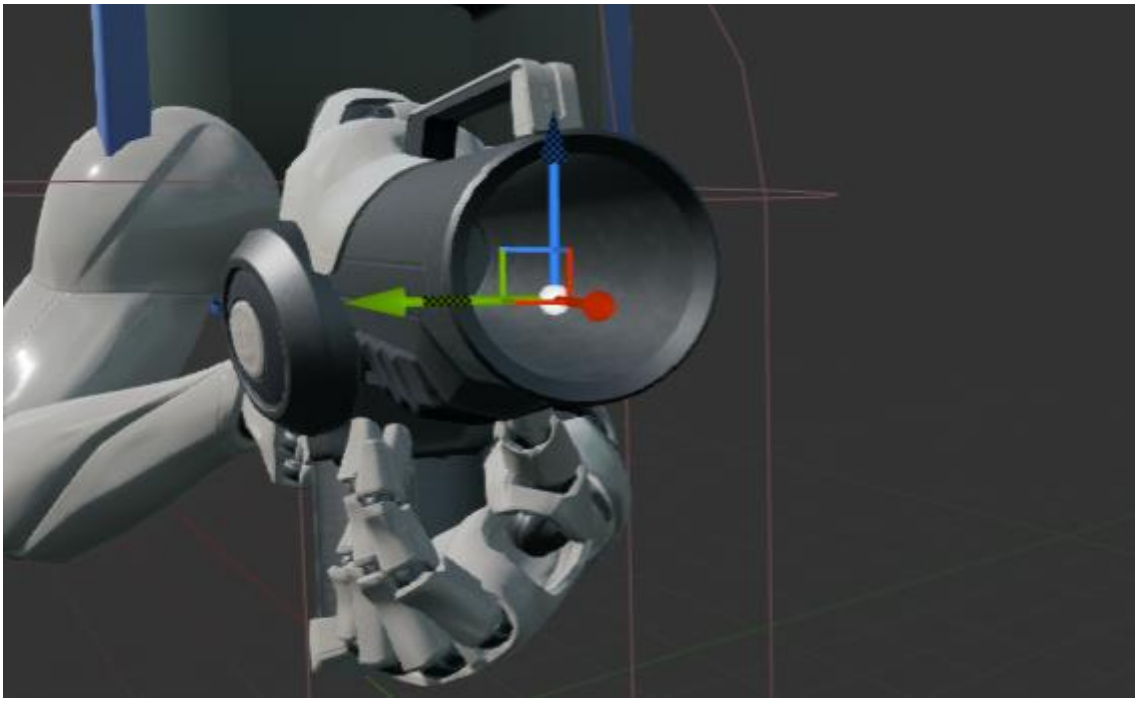
Turn
Mouse X
Scale 1.0
LookUpRate
Gamepad Right Thumbstick Y-Ax
Scale 1.0
LookUp
Mouse Y
Scale -1.0

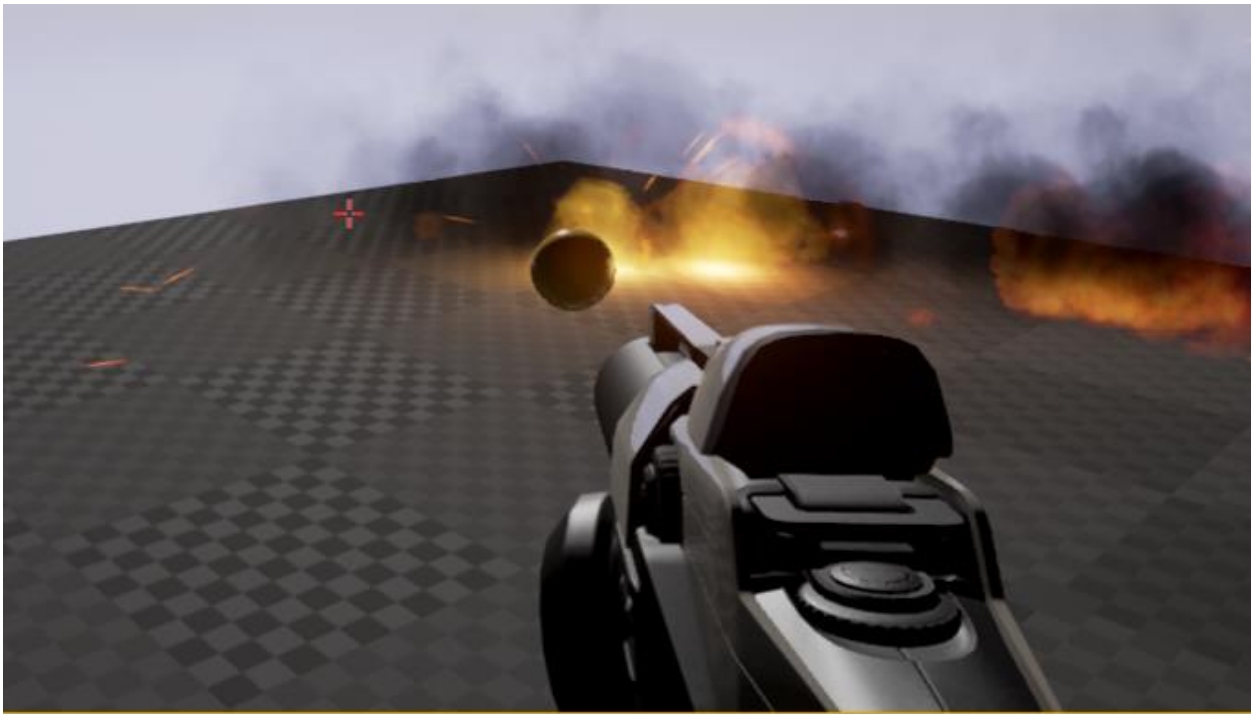

Jump
Space Bar
Shift Ctrl Alt Cmd
Gamepad Face Button Bottom
Shift Ctrl Alt Cmd
Fire
Left Mouse Button
Shift Ctrl Alt Cmd
Gamepad Right Trigger
Shift Ctrl Alt Cmd
Track
Right Mouse Button
Shift Ctrl Alt Cmd
Gamepad Left Trigger
Shift Ctrl Alt Cmd

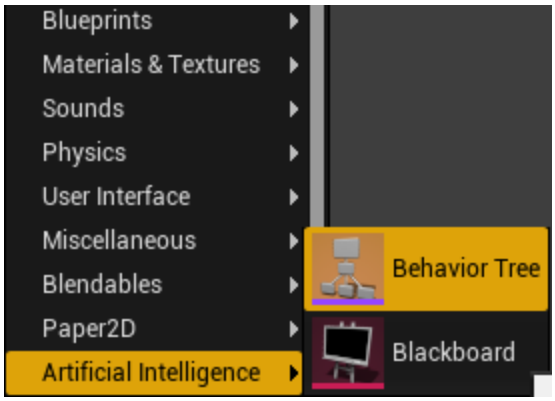


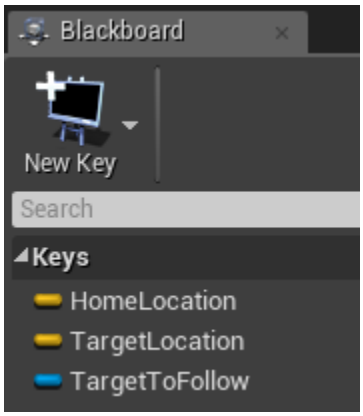


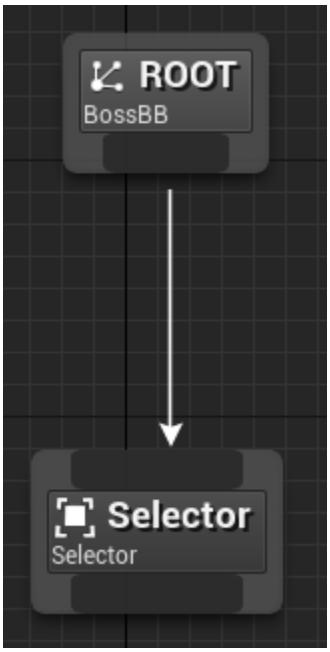


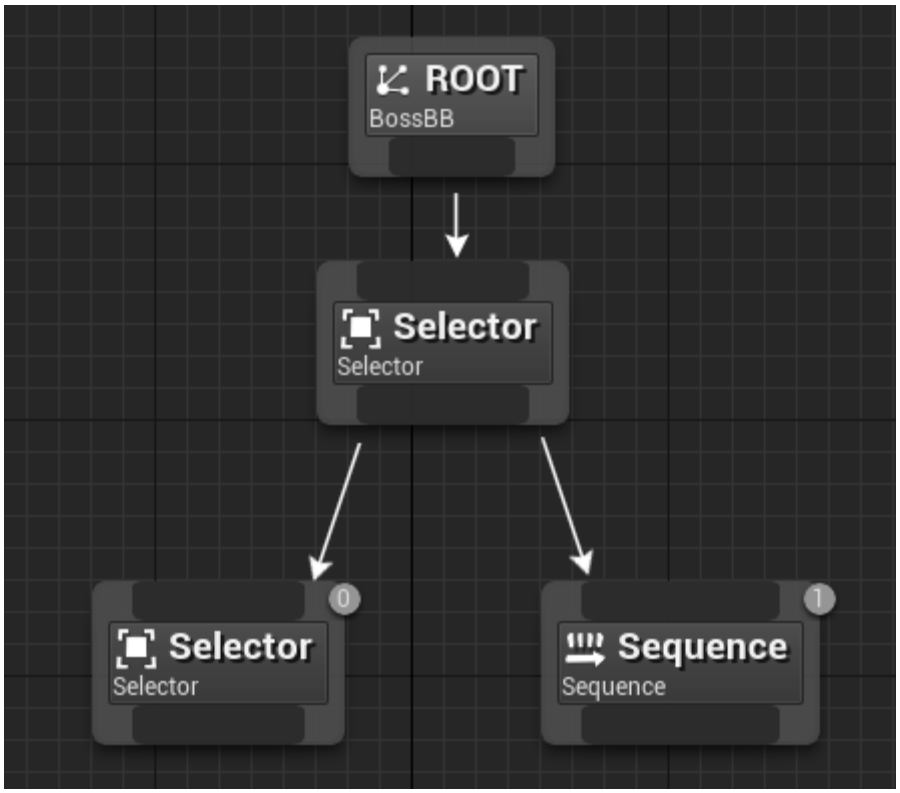




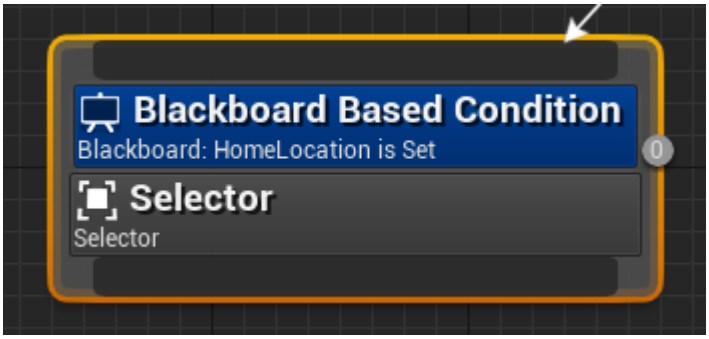

Blueprints
Materials & Textures
Sounds
Physics
User Interface
Miscellaneous
Blendables
Paper2D
Artificial Intelligence
Behavior Tree
Blackboard

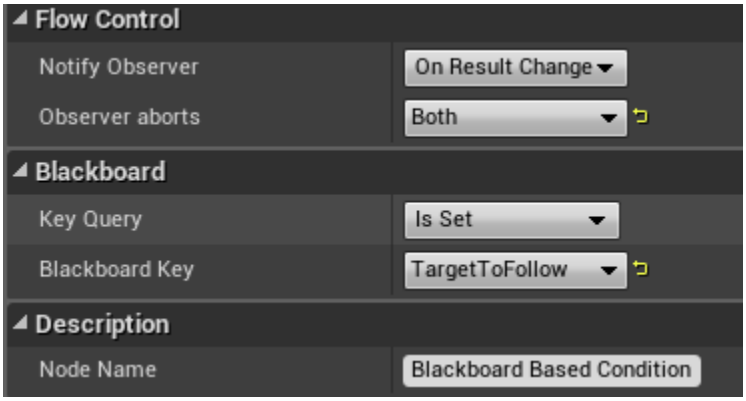

Blackboard
New Key
Search
Keys
HomeLocation
TargetLocation
TargetToFollow

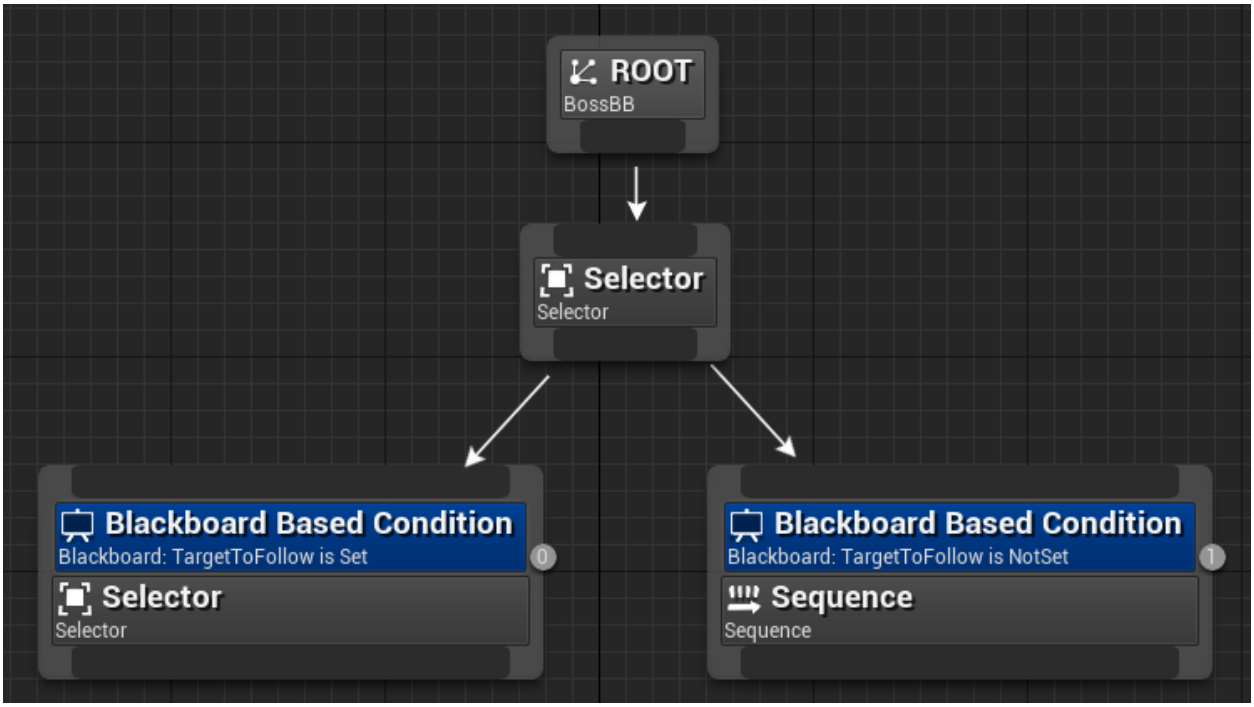

ROOT
BossBB
Selector
Selector

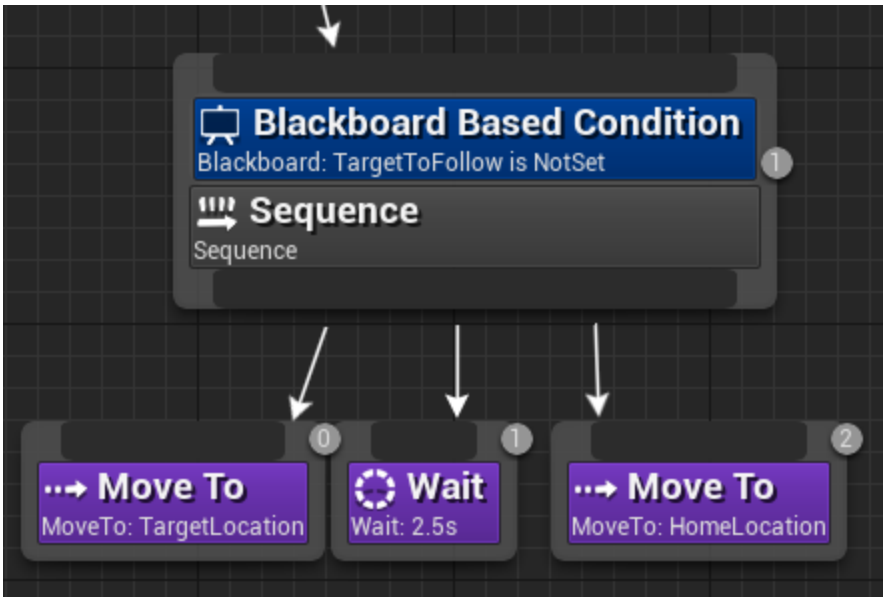

ROOT
BossBB
Selector
Selector
0
Selector
Selector
1
Sequence
Sequence

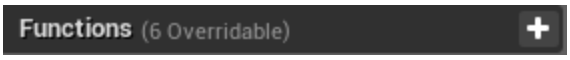
0
Selector
Selector
1
Sequence
Sequence
Breakpoints
Toggle breakpoint F9
Add breakpoint
Node Actions
Delete Delete
Cut Ctrl+X
Copy Ctrl+C
Duplicate Ctrl+W
Break Link(s)
Add Decorator...
Add Service
Search
Blackboard
Check Gameplay Tags on Actor
Compare BBEntries
Composite
Conditional Loop
Cone Check
Cooldown
Does Path Exist
Force Success

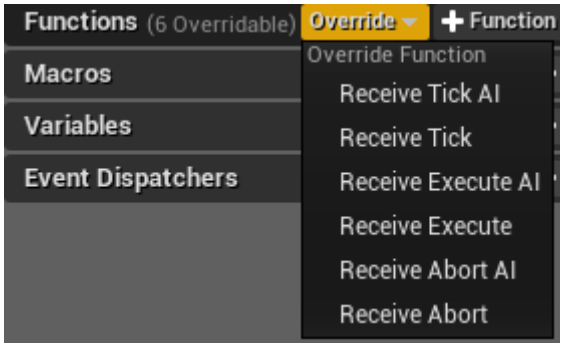

Blackboard Based Condition
Blackboard: HomeLocation is Set
0
Selector
Selector


Flow Control
Notify Observer
On Result Change
Observer aborts
Both
Blackboard
Key Query
Is Set
Blackboard Key
TargetToFollow
Description
Node Name
Blackboard Based Condition

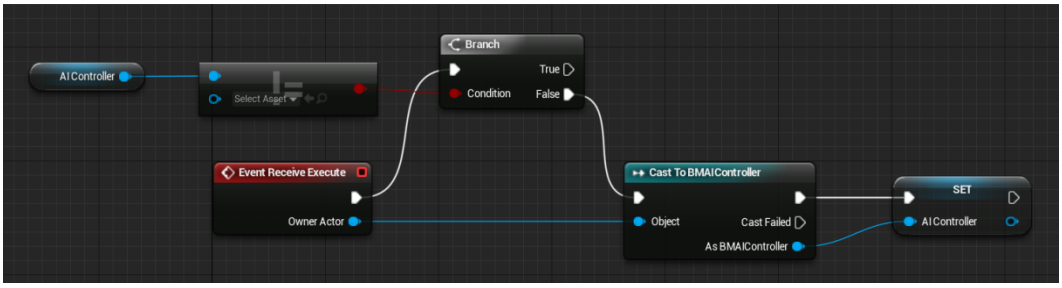

ROOT
BossBB
Selector
Selector
Blackboard Based Condition
Blackboard: TargetToFollow is Set
0
Selector
Selector
Blackboard Based Condition
Blackboard: TargetToFollow is NotSet
1
Sequence
Sequence

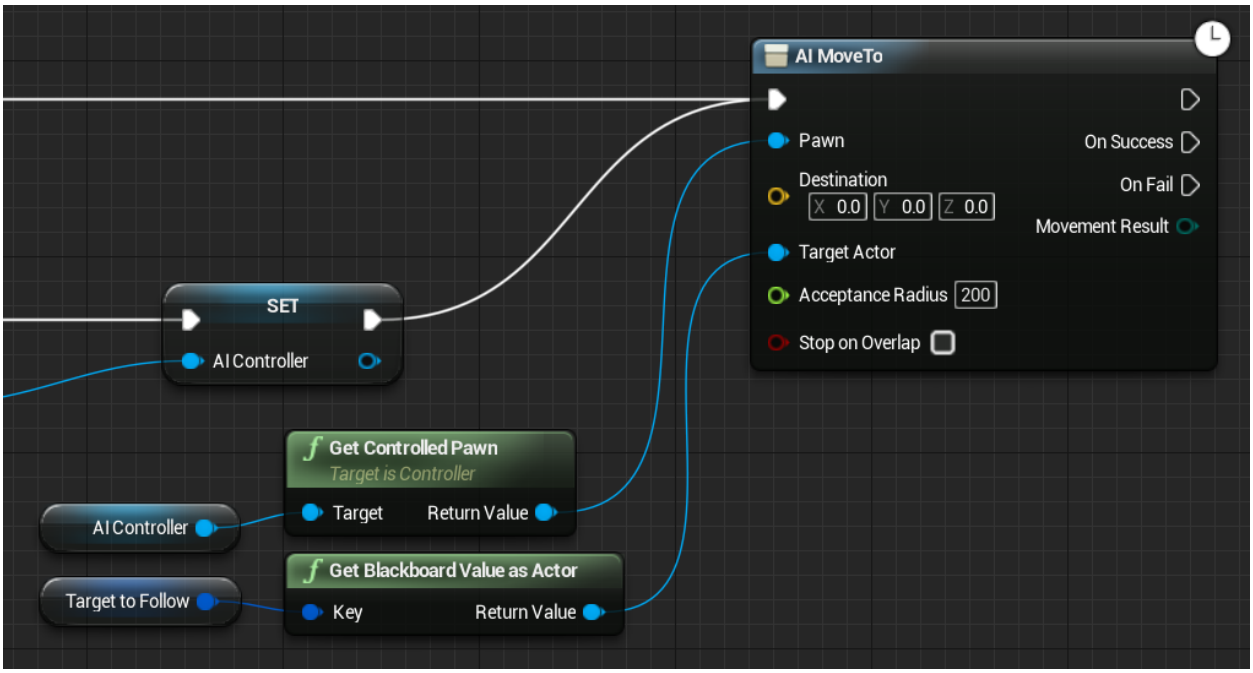

Blackboard Based Condition
Blackboard: TargetToFollow is NotSet
1
Sequence
Sequence
0
1
2
Move To
MoveTo: TargetLocation
Wait
Wait: 2.5s
Move To
MoveTo: HomeLocation

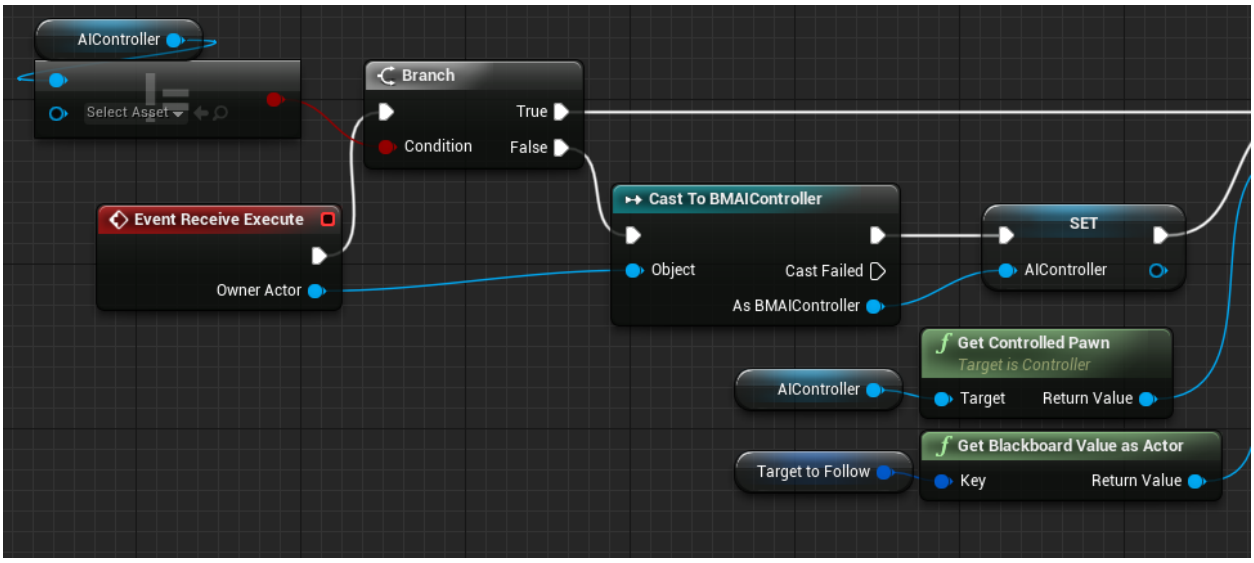

Functions (6 Overridable)

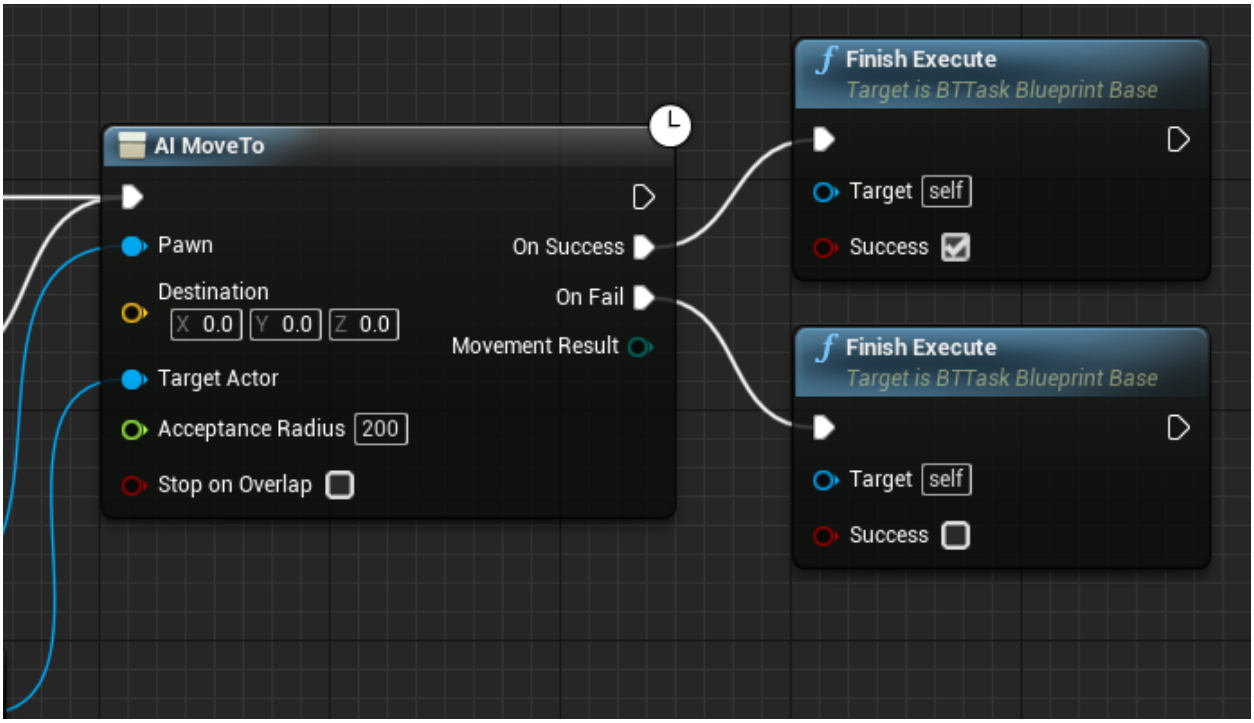

Functions (6 Overridable)
Override
Function
Macros
Variables
Event Dispatchers
Override Function
Receive Tick AI
Receive Tick
Receive Execute AI
Receive Execute
Receive Abort AI
Receive Abort

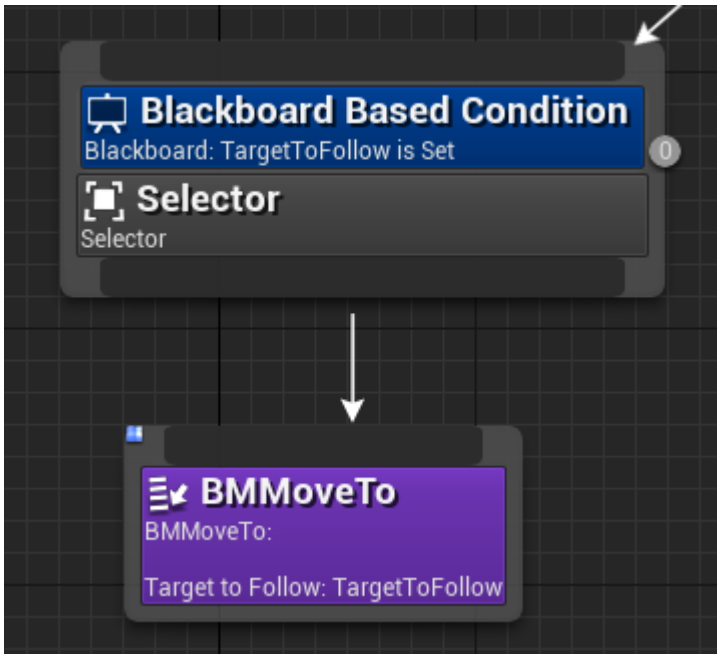
TargetToFollow

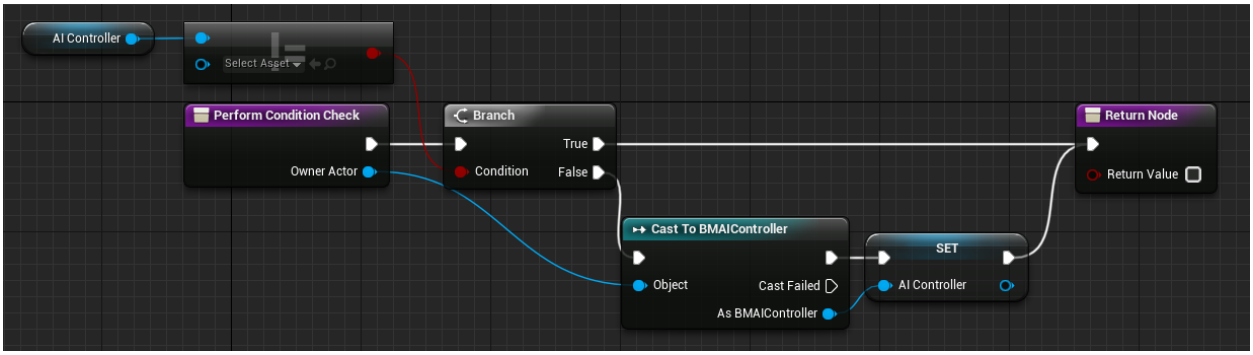

AI Controller
Select Asset
Branch
True
Condition
False
Event Receive Execute
Owner Actor
Cast To BMAIController
Object
Cast Failed
As BMAIController
SET
AI Controller

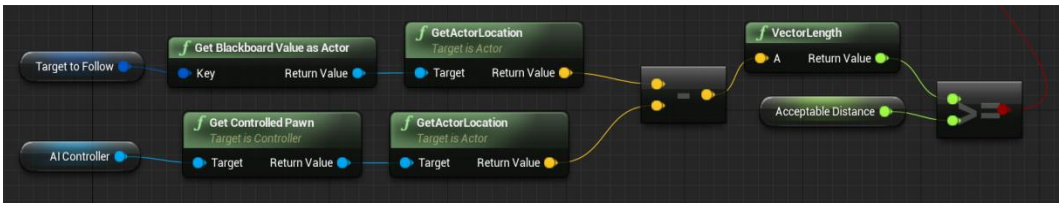

AI MoveTo
Pawn
Destination
X 0.0
Y 0.0
Z 0.0
Target Actor
Acceptance Radius
200
Stop on Overlap
On Success
On Fail
Movement Result
SET
AI Controller
Get Controlled Pawn
Target is Controller
Target
Return Value
AI Controller
Get Blackboard Value as Actor
Target to Follow
Key
Return Value

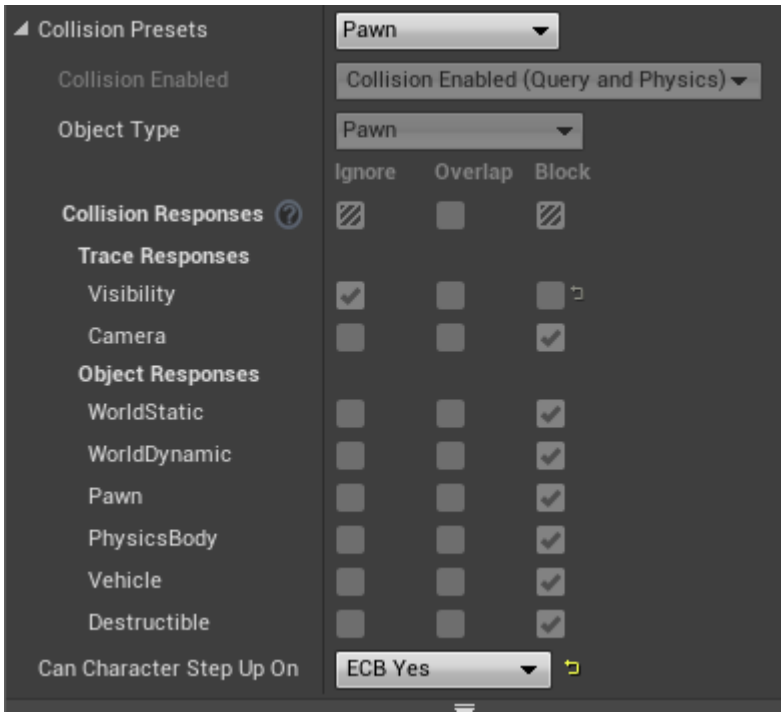

AIController
Select Asset
Branch
True
Condition
False
Event Receive Execute
Owner Actor
Cast To BMAIController
Object
Cast Failed
As BMAIController
SET
AIController
Get Controlled Pawn
Target is Controller
AIController
Target
Return Value
Get Blackboard Value as Actor
Target to Follow
Key
Return Value

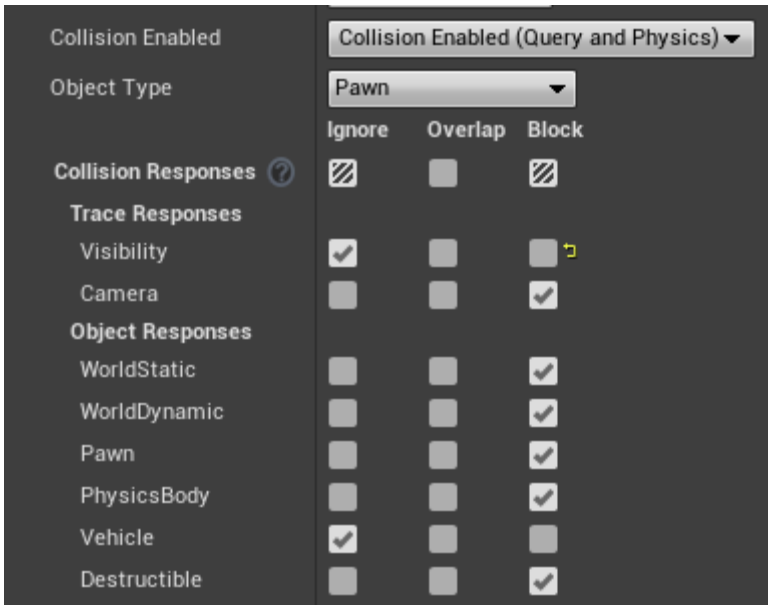

AI MoveTo
Pawn
Destination
X 0.0
Y 0.0
Z 0.0
Target Actor
Acceptance Radius
200
Stop on Overlap
On Success
On Fail
Movement Result
Finish Execute
Target is BTTask Blueprint Base
Target
self
Success
Finish Execute
Target is BTTask Blueprint Base
Target
self
Success

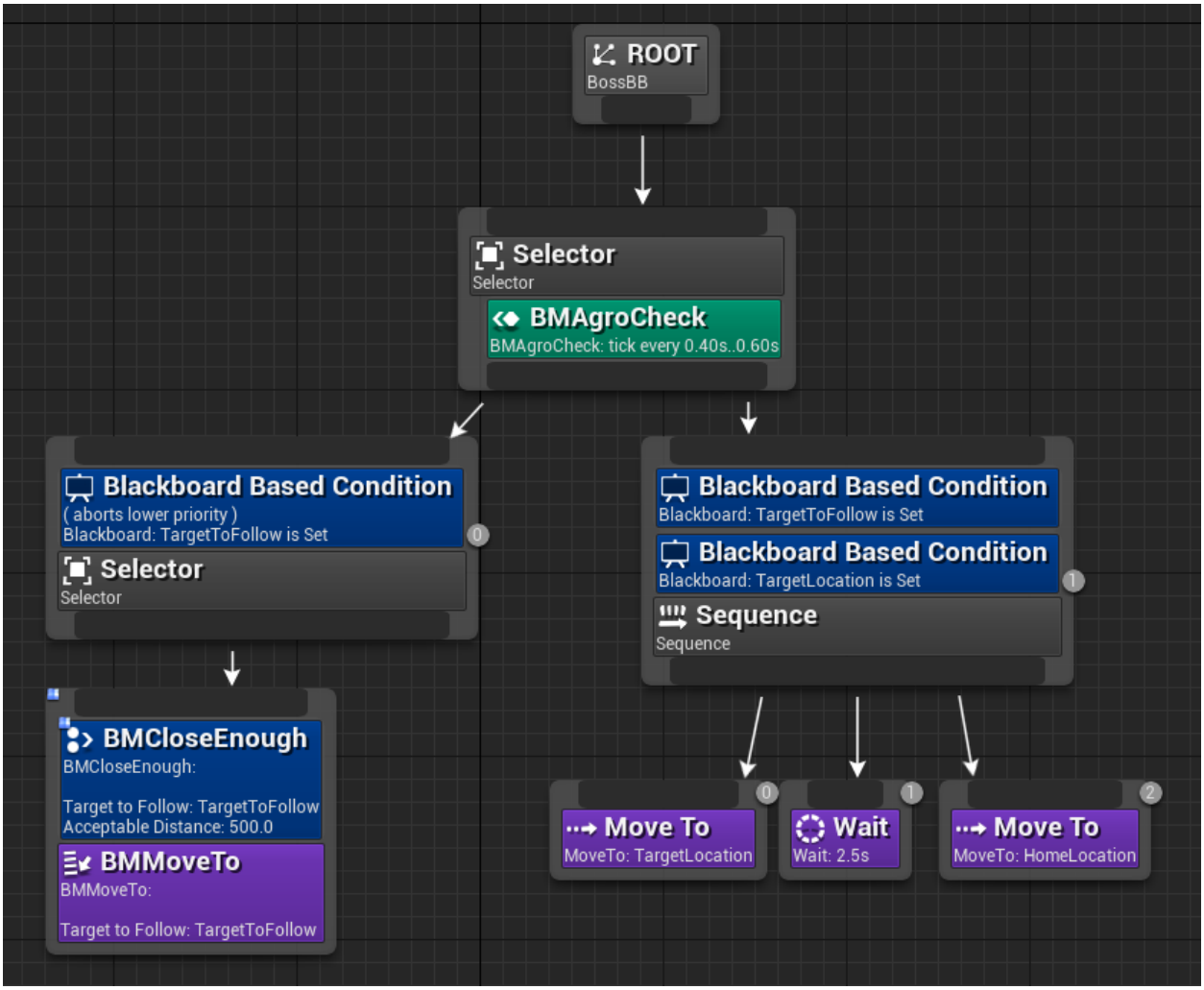

Blackboard Based Condition
Blackboard: TargetToFollow is Set
0
Selector
Selector
BMMoveTo
BMMoveTo:
Target to Follow: TargetToFollow


AI Controller
Select Asset
Perform Condition Check
Owner Actor
Branch
Condition
True
False
Return Node
Return Value
Cast To BMAIController
Object
Cast Failed
As BMAIController
SET
AI Controller

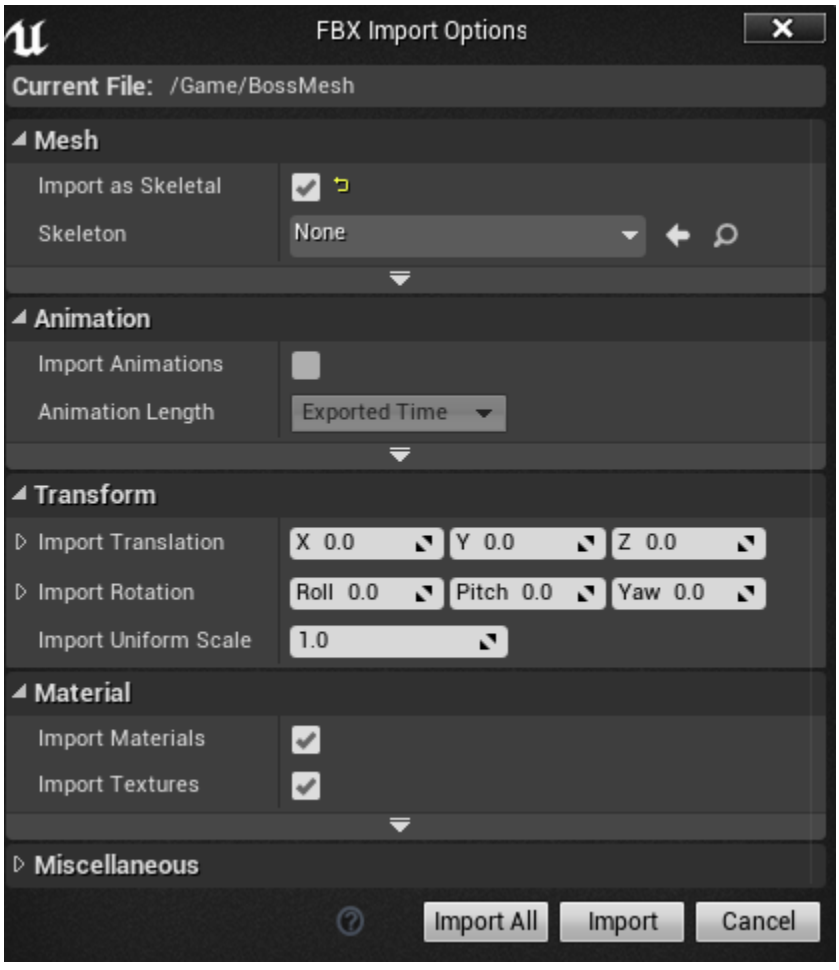

Target to Follow
Get Blackboard Value as Actor
Key
Return Value
GetActorLocation
Target is Actor
Target
Return Value
VectorLength
A
Return Value
Acceptable Distance
AI Controller
Get Controlled Pawn
Target is Controller
Target
Return Value
GetActorLocation
Target is Actor
Target
Return Value

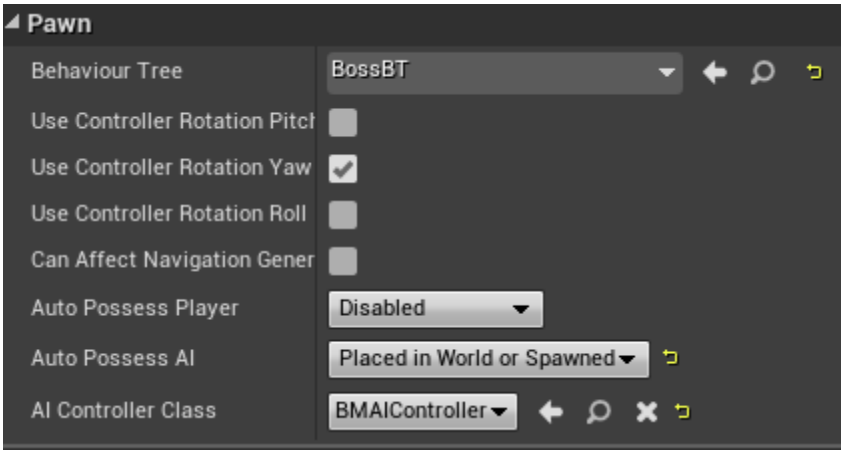

Collision Presets
Pawn
Collision Enabled
Collision Enabled (Query and Physics)
Object Type
Pawn
Ignore
Overlap
Block
Collision Responses
Trace Responses
Visibility
Camera
Object Responses
WorldStatic
WorldDynamic
Pawn
PhysicsBody
Vehicle
Destructible
Can Character Step Up On
ECB Yes

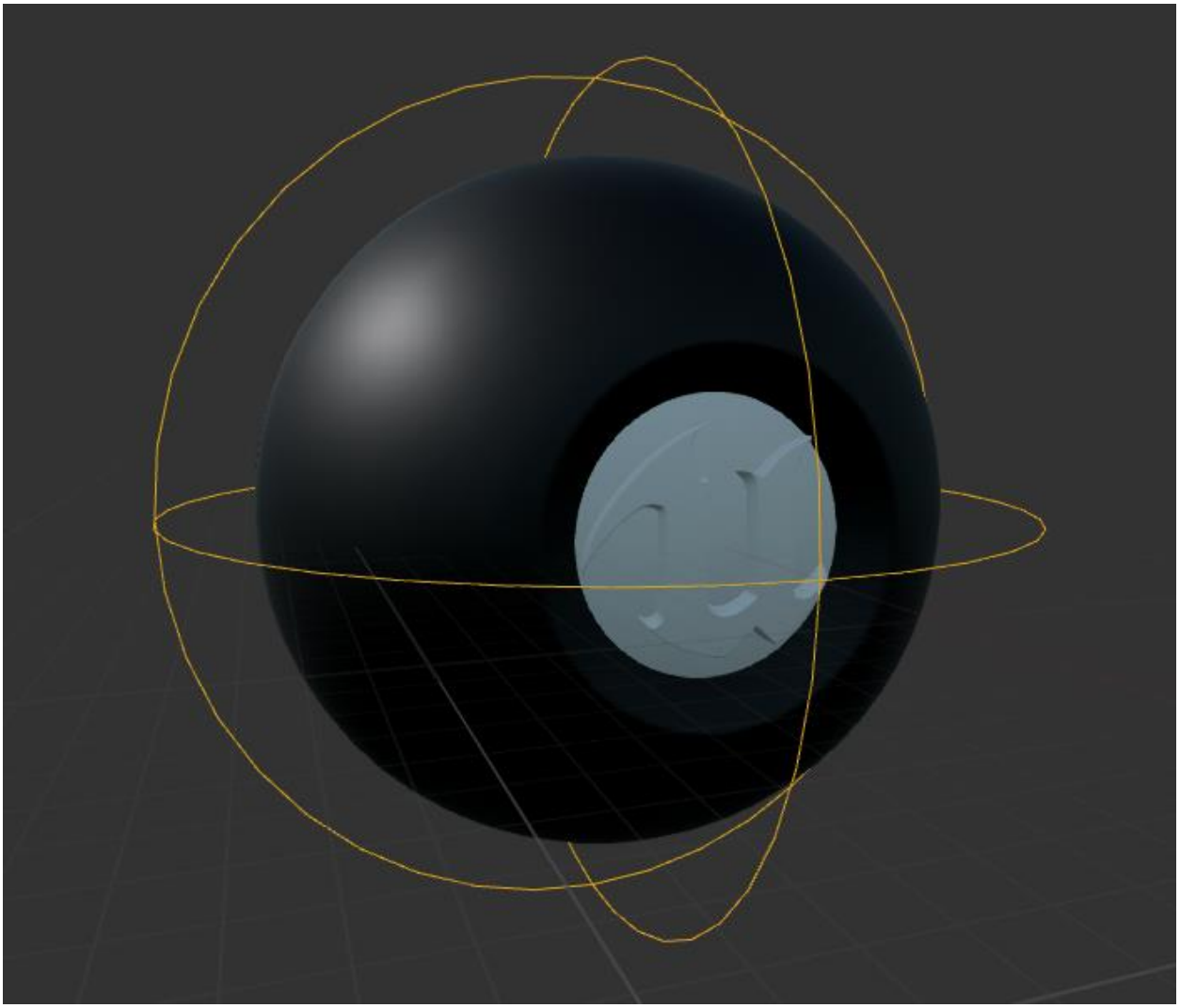

Collision Enabled
Collision Enabled (Query and Physics)
Object Type
Pawn
Ignore
Overlap
Block
Collision Responses
Trace Responses
Visibility
Camera
Object Responses
WorldStatic
WorldDynamic
Pawn
PhysicsBody
Vehicle
Destructible

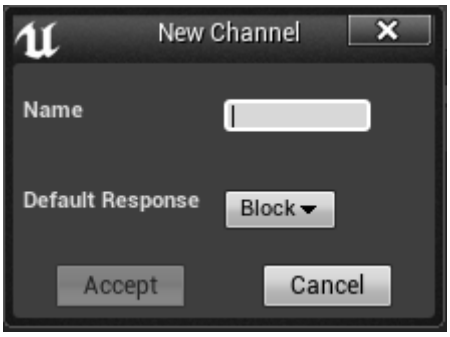

ROOT
BossBB
Selector
Selector
BMAgroCheck
BMAgroCheck: tick every 0.40s..0.60s
Blackboard Based Condition
(aborts lower priority)
Blackboard: TargetToFollow is Set
0
Selector
Selector
BMCloseEnough
BMCloseEnough:
Target to Follow: TargetToFollow
Acceptable Distance: 500.0
BMMoveTo
BMMoveTo:
Target to Follow: TargetToFollow
Blackboard Based Condition
Blackboard: TargetToFollow is Set
Blackboard Based Condition
Blackboard: TargetLocation is Set
1
Sequence
Sequence
0
Move To
MoveTo: TargetLocation
1
Wait
Wait: 2.5s
2
Move To
MoveTo: HomeLocation

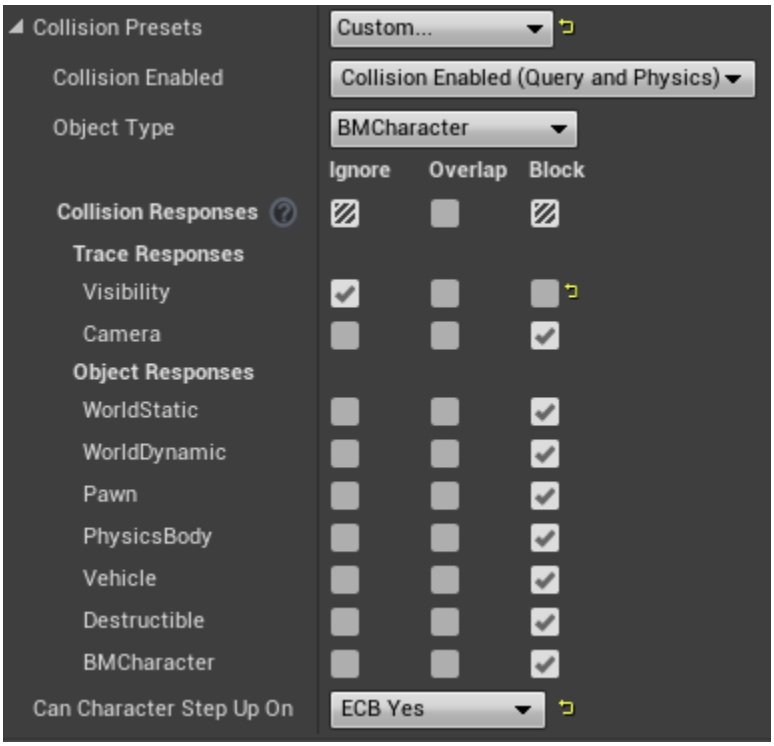
Service
Interval
0.5
Random Deviation
0.1
Call Tick on Search Start
Restart Timer on Each Activation


FBX Import Options
Current File: /Game/BossMesh
Mesh
Import as Skeletal
Skeleton
None
Animation
Import Animations
Animation Length
Exported Time
Transform
Import Translation
X 0.0
Y 0.0
Z 0.0
Import Rotation
Roll 0.0
Pitch 0.0
Yaw 0.0
Import Uniform Scale
1.0
Material
Import Materials
Import Textures
Miscellaneous
Import All
Import
Cancel

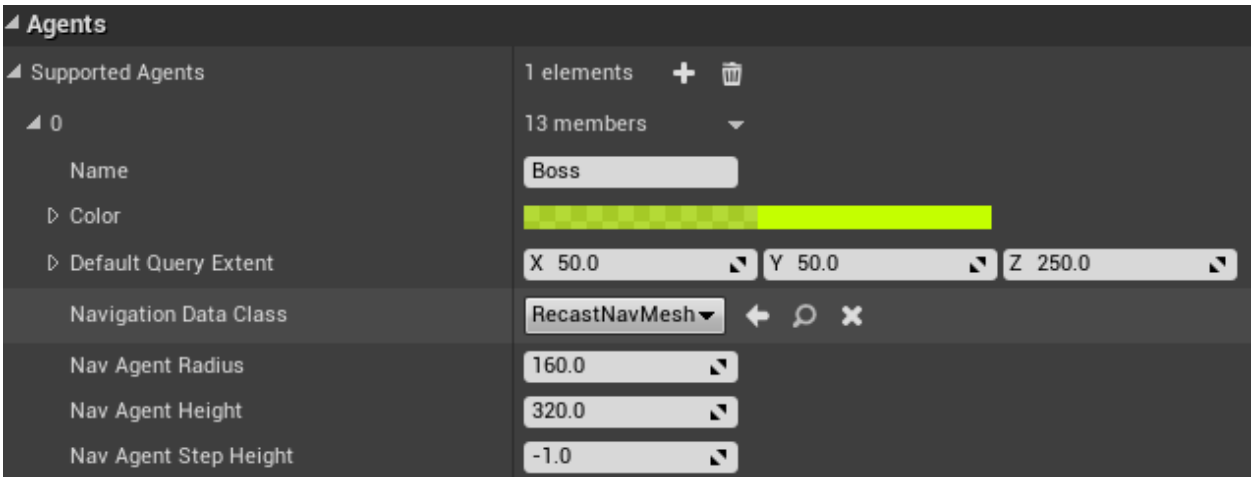

Pawn
Behaviour Tree
BossBT
Use Controller Rotation Pitch
Use Controller Rotation Yaw
Use Controller Rotation Roll
Can Affect Navigation Gener
Auto Possess Player
Disabled
Auto Possess AI
Placed in World or Spawned
AI Controller Class
BMAIController

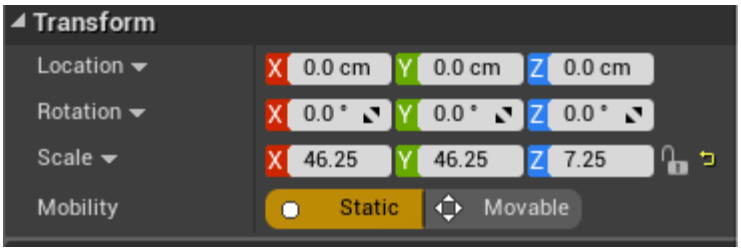


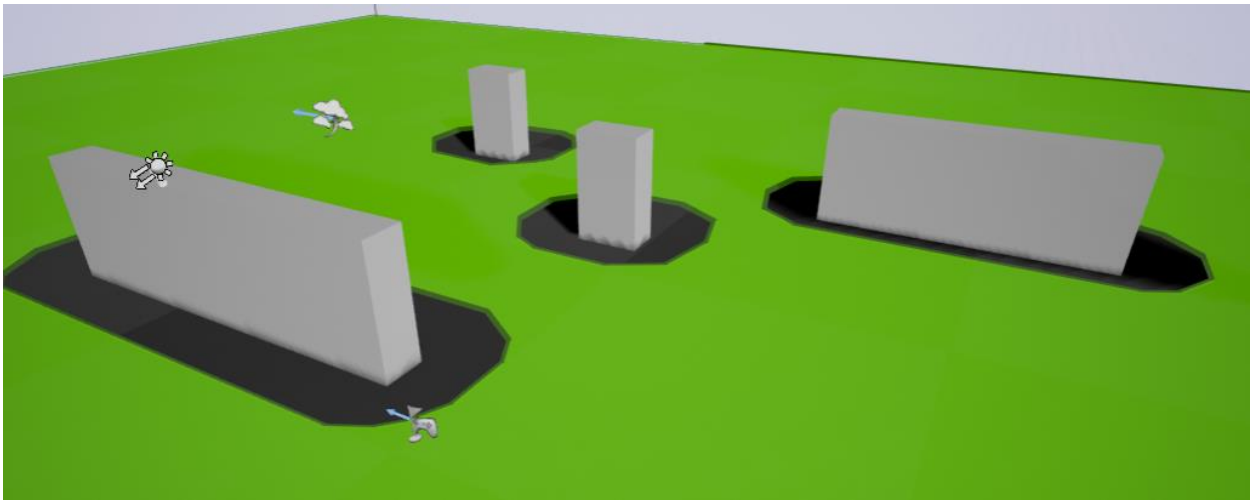

New Channel
Name
Default Response
Block
Accept
Cancel

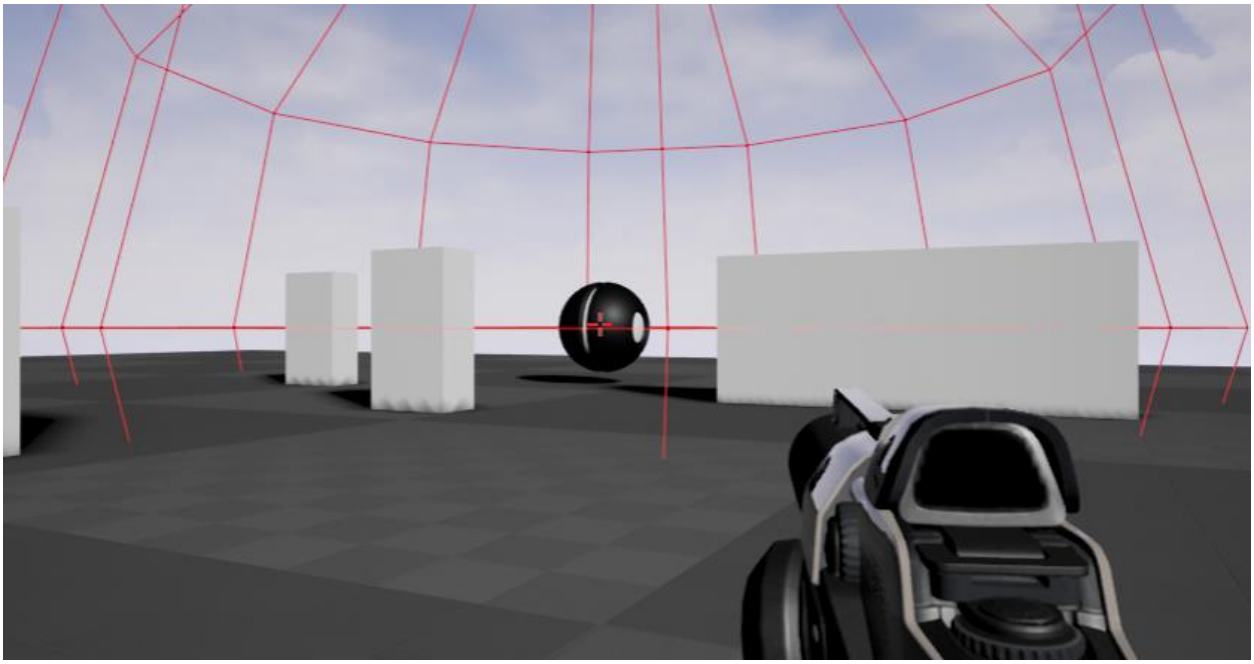

Collision Presets
Custom...
Collision Enabled
Collision Enabled (Query and Physics)
Object Type
BMCharacter
Ignore
Overlap
Block
Collision Responses
Trace Responses
Visibility
Camera
Object Responses
WorldStatic
WorldDynamic
Pawn
PhysicsBody
Vehicle
Destructible
BMCharacter
Can Character Step Up On
ECB Yes

Agent Radius
160.0
Agent Height
320.0
Agent Max Height
340.0
Agent Max Slope
44.0

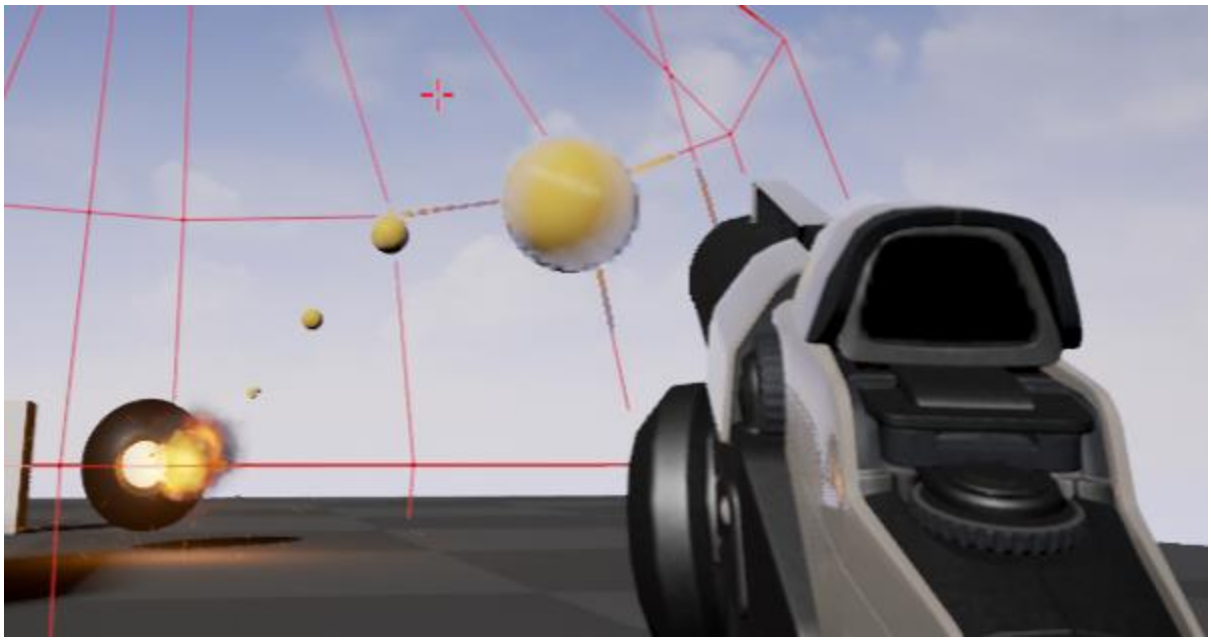

Agents
Supported Agents
1 elements
0
13 members
Name
Boss
Color
Default Query Extent
X 50.0
Y 50.0
Z 250.0
Navigation Data Class
RecastNavMesh
Nav Agent Radius
160.0
Nav Agent Height
320.0
Nav Agent Step Height
-1.0

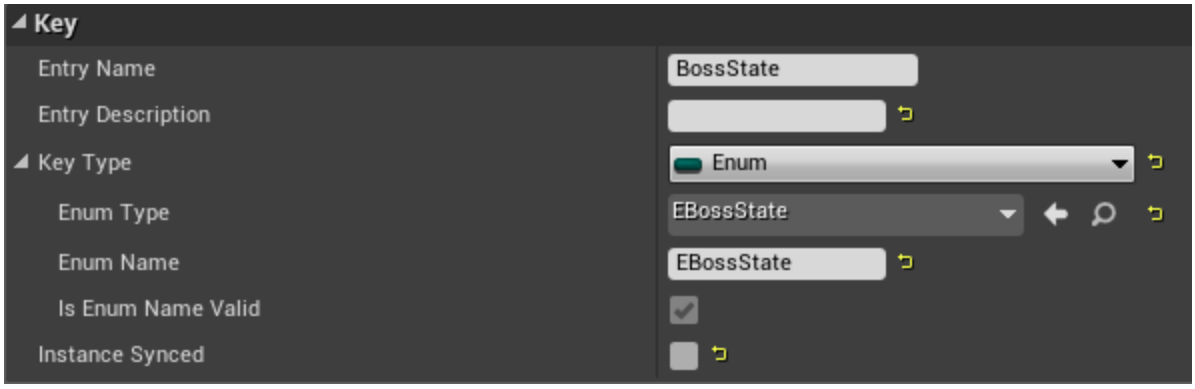

Transform
Location
X 0.0 cm
Y 0.0 cm
Z 0.0 cm
Rotation
X 0.0 °
Y 0.0 °
Z 0.0 °
Scale
X 46.25
Y 46.25
Z 7.25
Mobility
Static
Movable

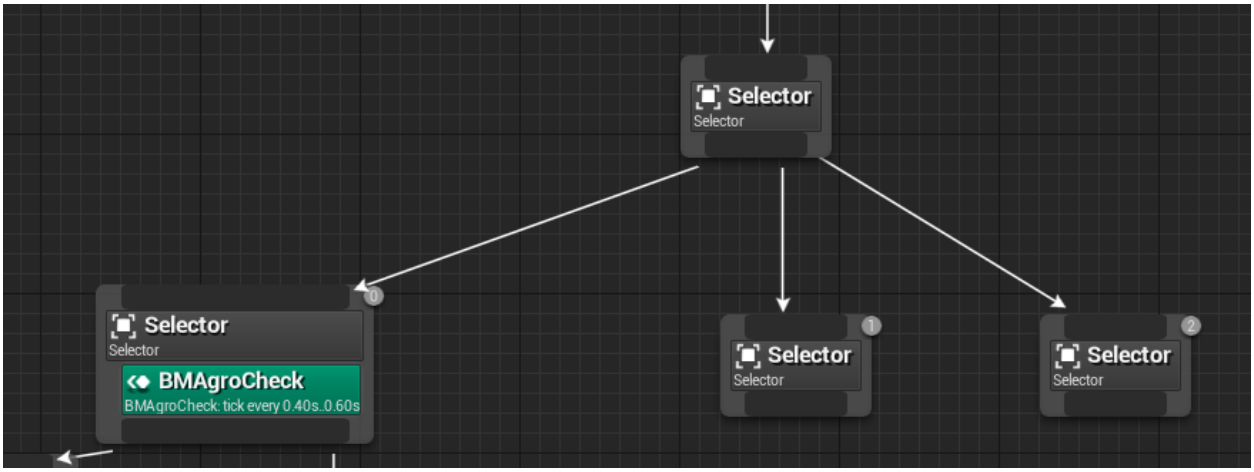


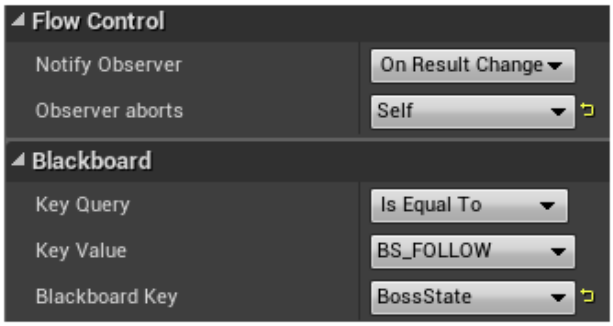


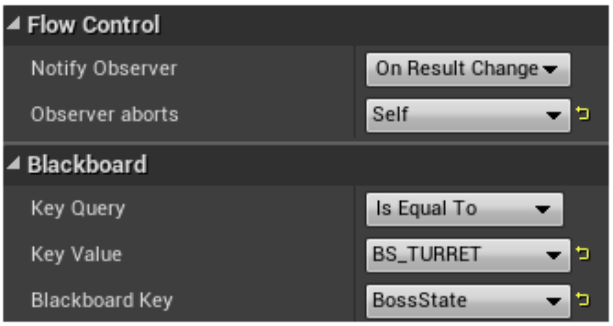
Chapter 8: Advanced AI and Unreal Rendering

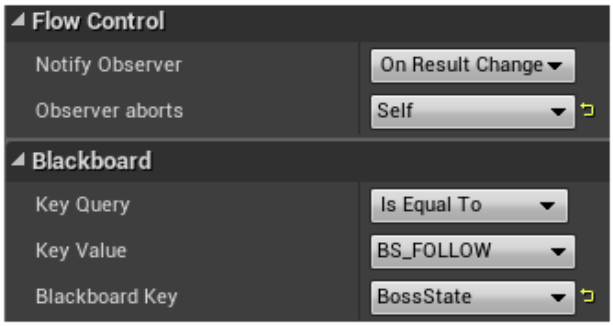


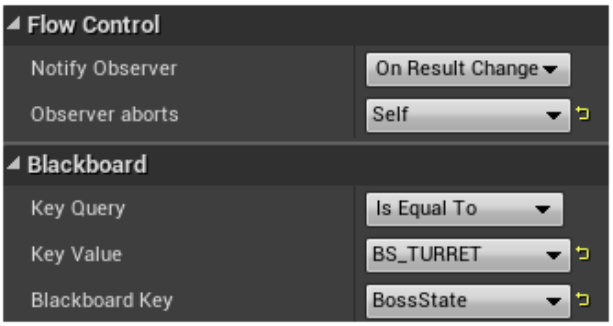

Key
Entry Name
BossState
Entry Description
Key Type
Enum
Enum Type
EBossState
Enum Name
EBossState
Is Enum Name Valid
Instance Synced

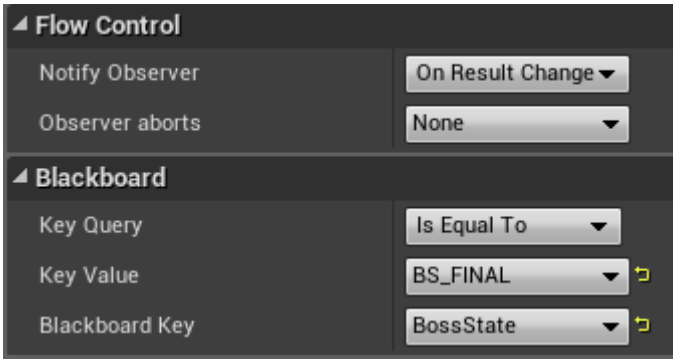

Selector
Selector
Selector
Selector
BMAgroCheck
BMAgroCheck: tick every 0.40s..0.60s
Selector
Selector
Selector
Selector

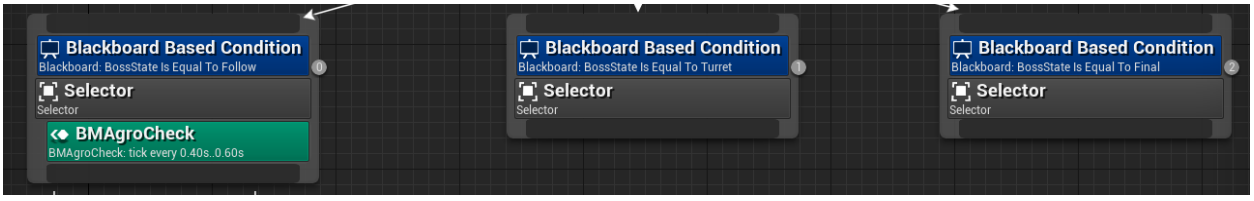

Flow Control
Notify Observer
On Result Change
Observer aborts
Self
Blackboard
Key Query
Is Equal To
Key Value
BS_FOLLOW
Blackboard Key
BossState

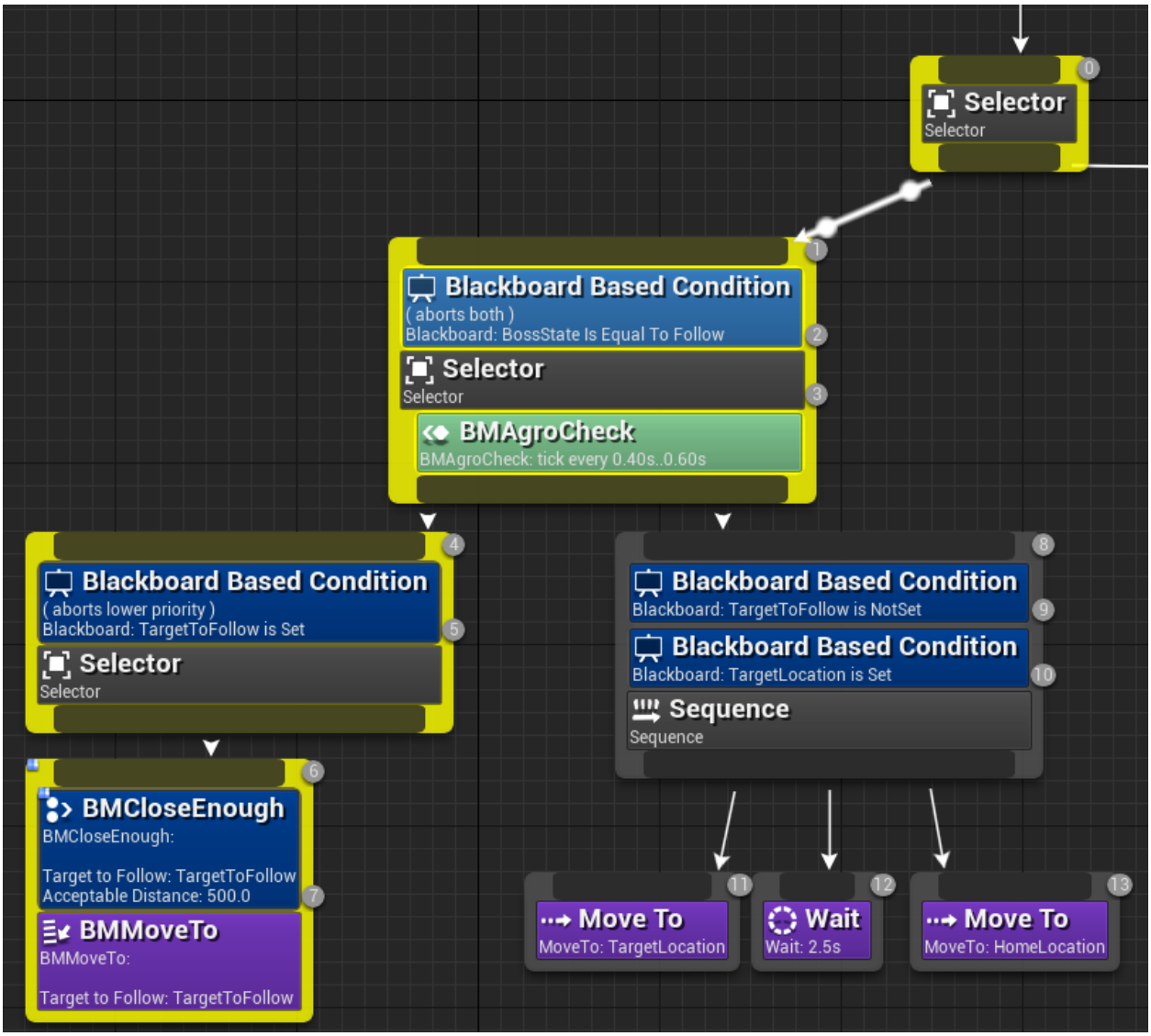

Flow Control
Notify Observer
On Result Change
Observer aborts
Self
Blackboard
Key Query
Is Equal To
Key Value
BS_TURRET
Blackboard Key
BossState


Flow Control
Notify Observer
On Result Change
Observer aborts
Self
Blackboard
Key Query
Is Equal To
Key Value
BS_FOLLOW
Blackboard Key
BossState

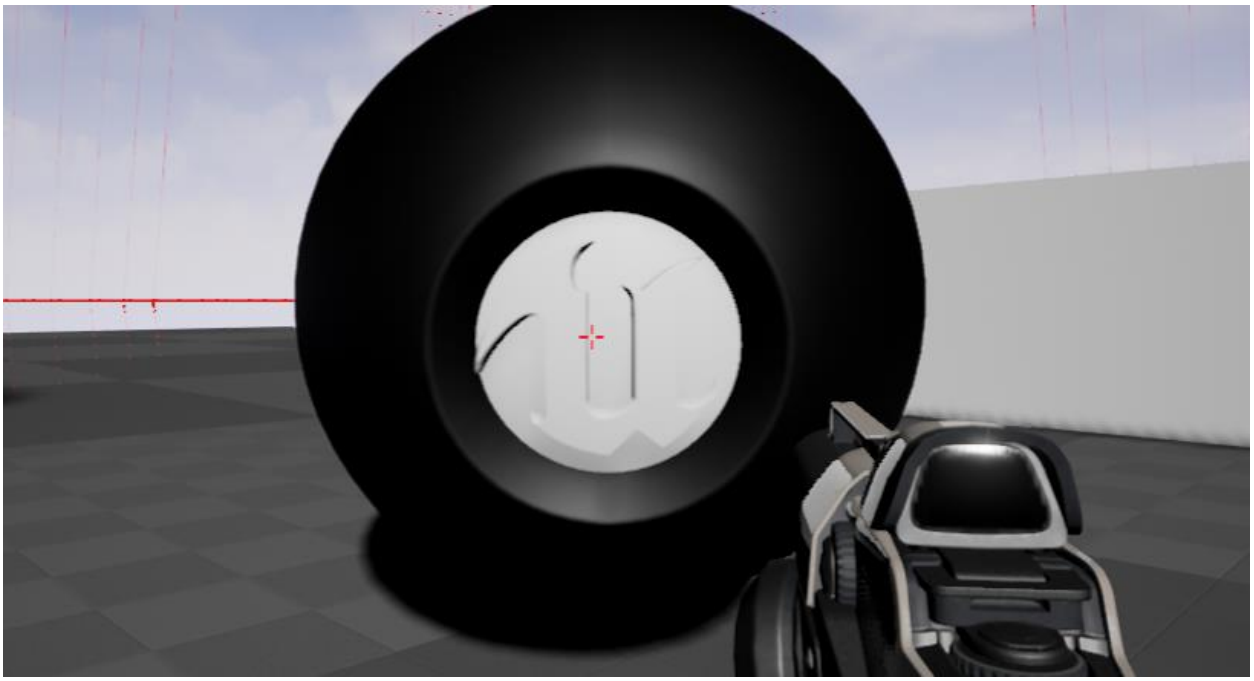

Flow Control
Notify Observer
On Result Change
Observer aborts
Self
Blackboard
Key Query
Is Equal To
Key Value
BS_TURRET
Blackboard Key
BossState

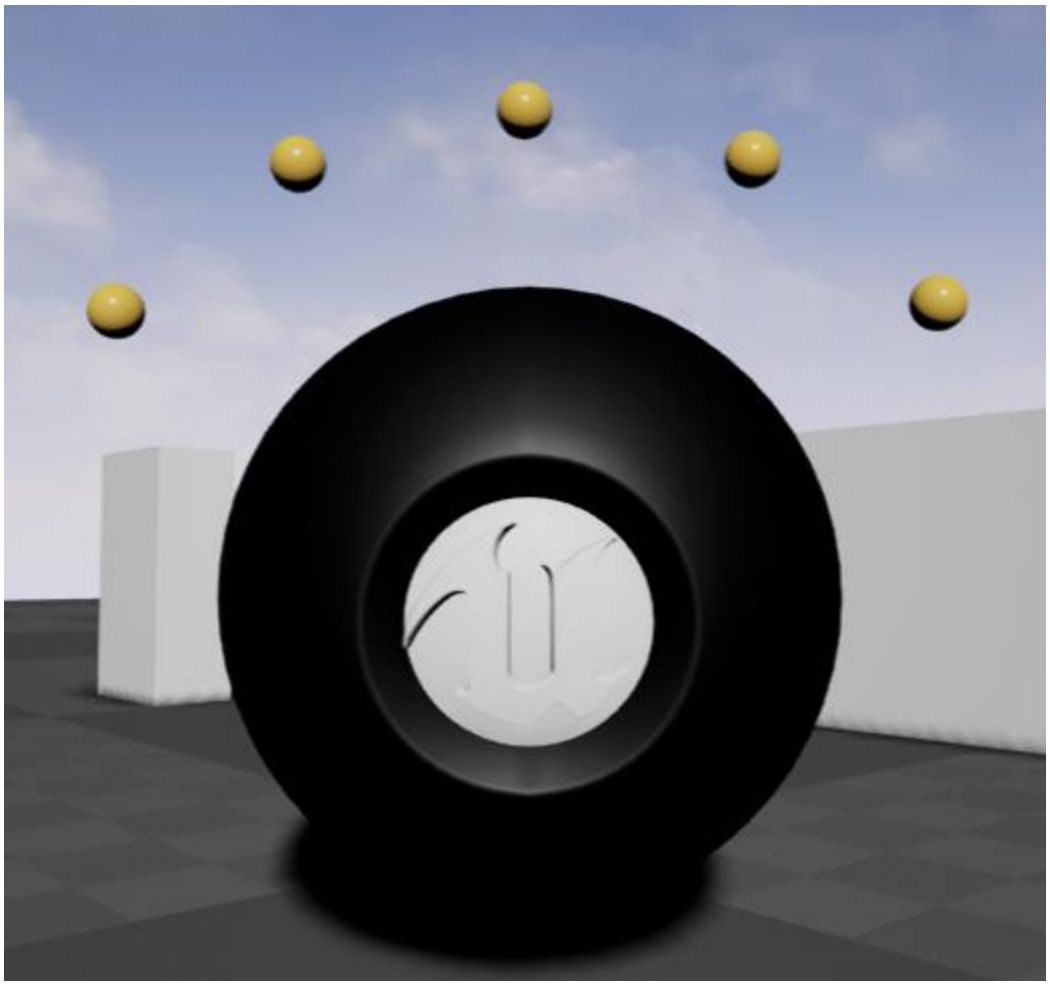

Flow Control
Notify Observer
On Result Change
Observer aborts
None
Blackboard
Key Query
Is Equal To
Key Value
BS_FINAL
Blackboard Key
BossState

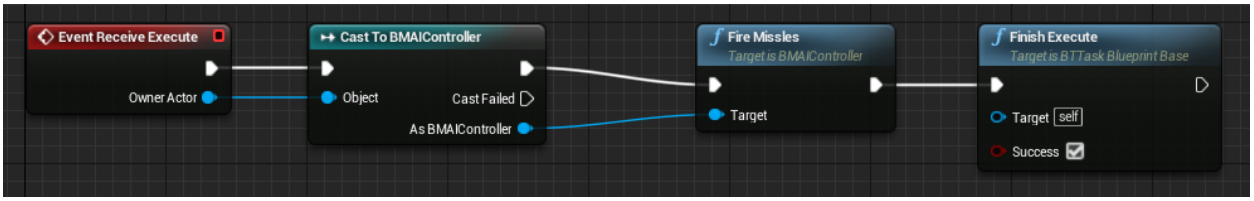

Blackboard Based Condition
Blackboard: BossState Is Equal To Follow
Selector
Selector
BMAgroCheck
BMAgroCheck: tick every 0.40s..0.60s
Blackboard Based Condition
Blackboard: BossState Is Equal To Turret
Selector
Selector
Blackboard Based Condition
Blackboard: BossState Is Equal To Final
Selector
Selector

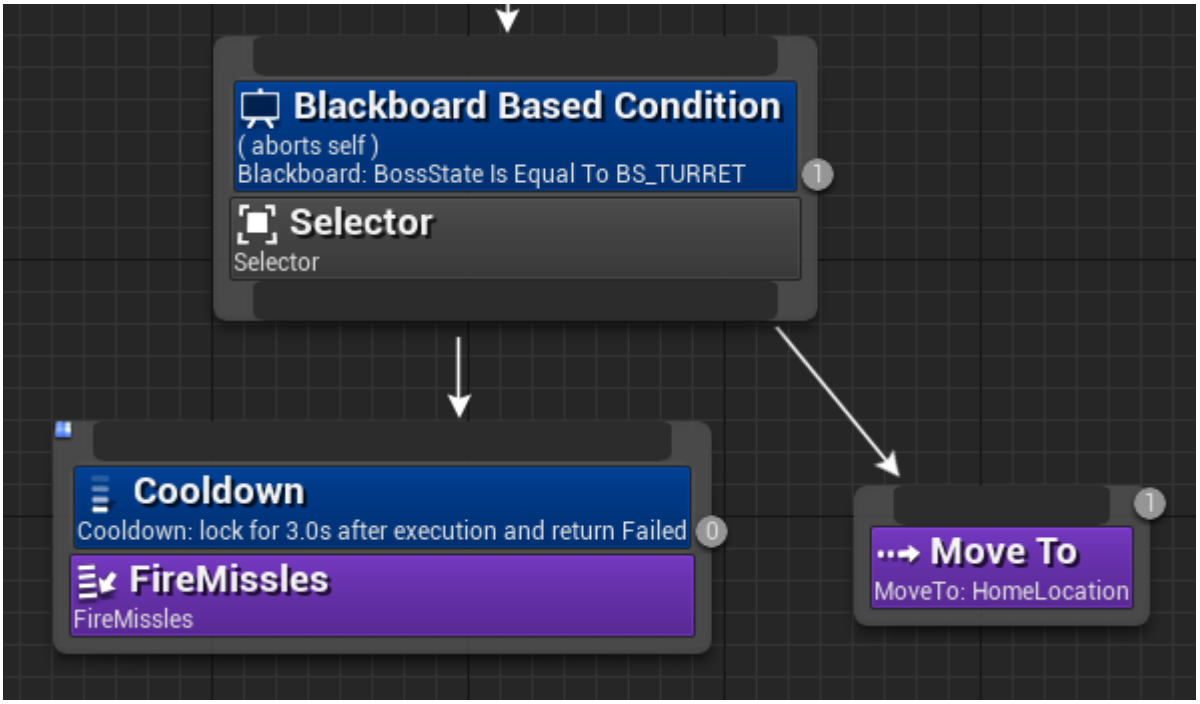


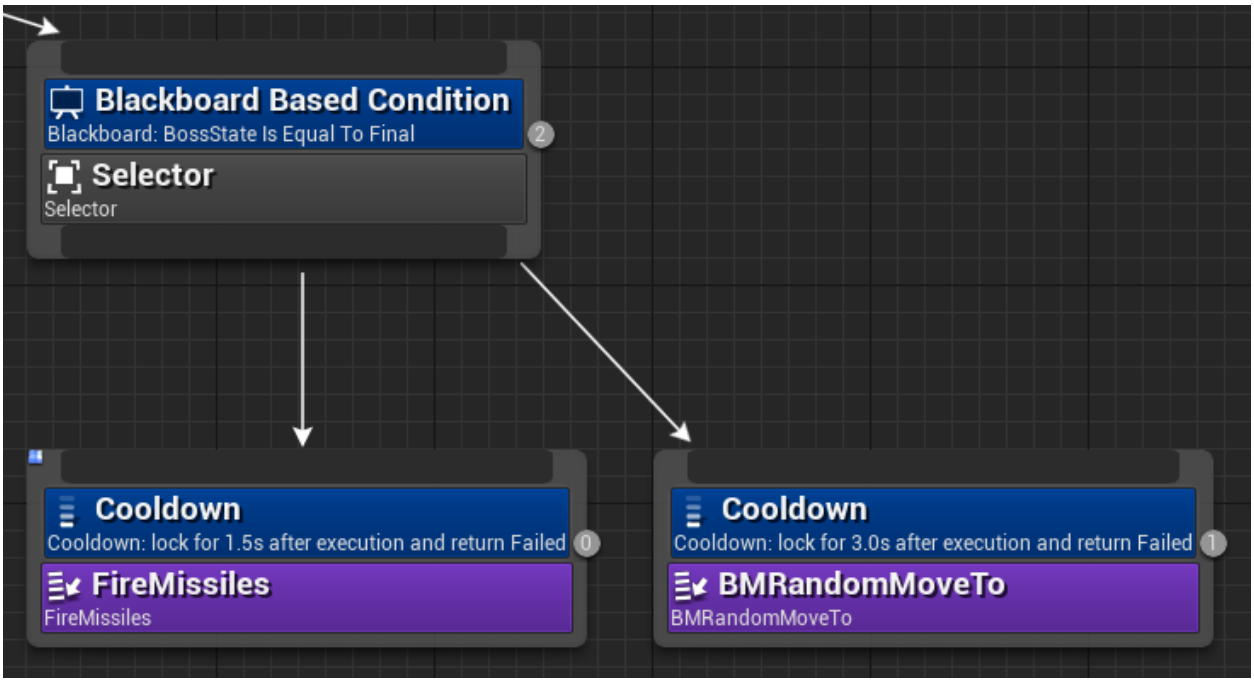
Keys	
HomeLocation	X=-3132.585 Y=19.177 Z=180.225
TargetLocation	X=-3335.440 Y=16.937 Z=118.150
TargetToFollow	FPCharacter_C_10
SelfActor	None
BossState	Follow

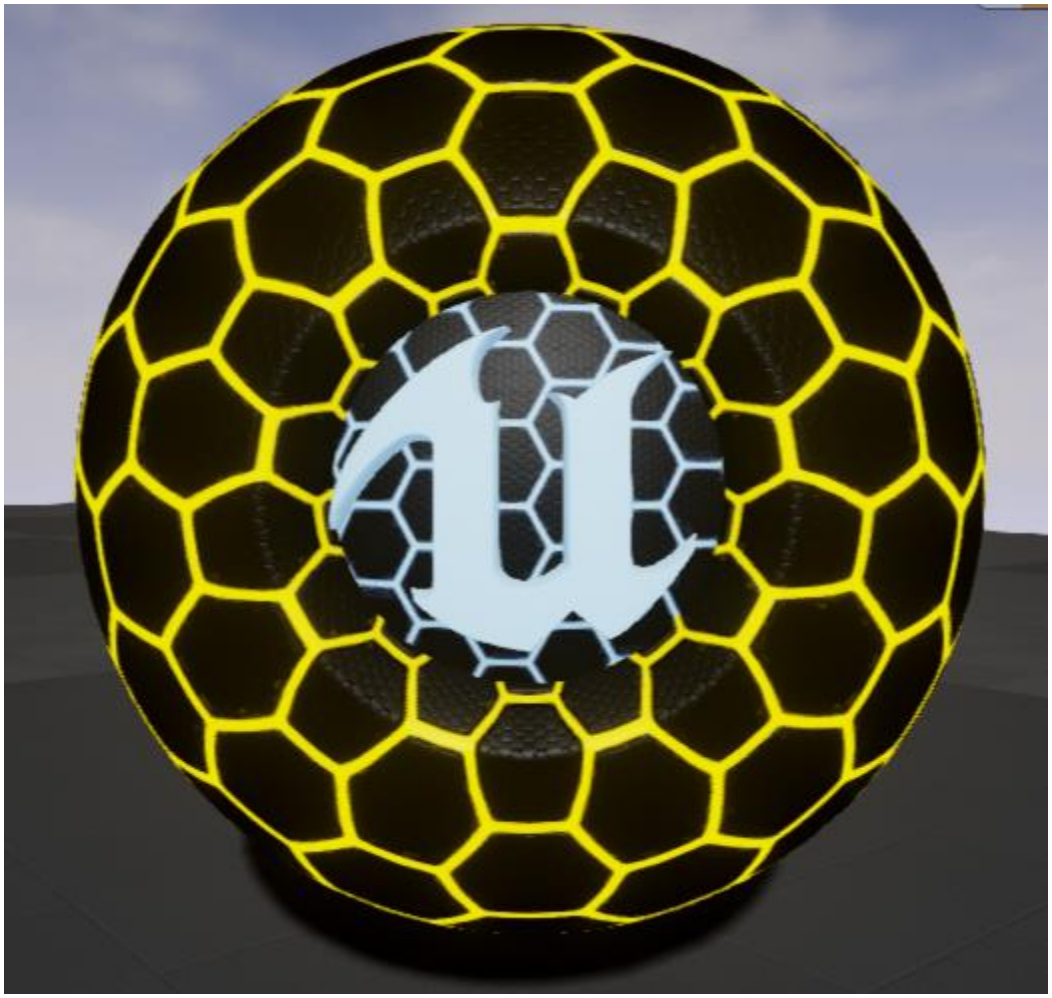


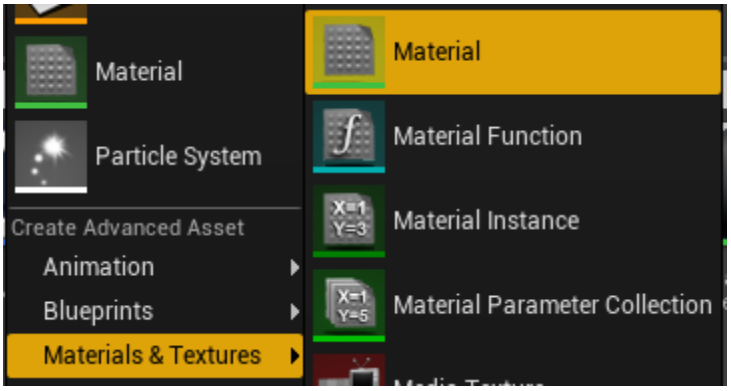



Event Receive Execute
Owner Actor
Cast To BMAIController
Object
Cast Failed
As BMAIController
Fire Missles
Target is BMAIController
Target
Finish Execute
Target is BTTask Blueprint Base
Target self
Success

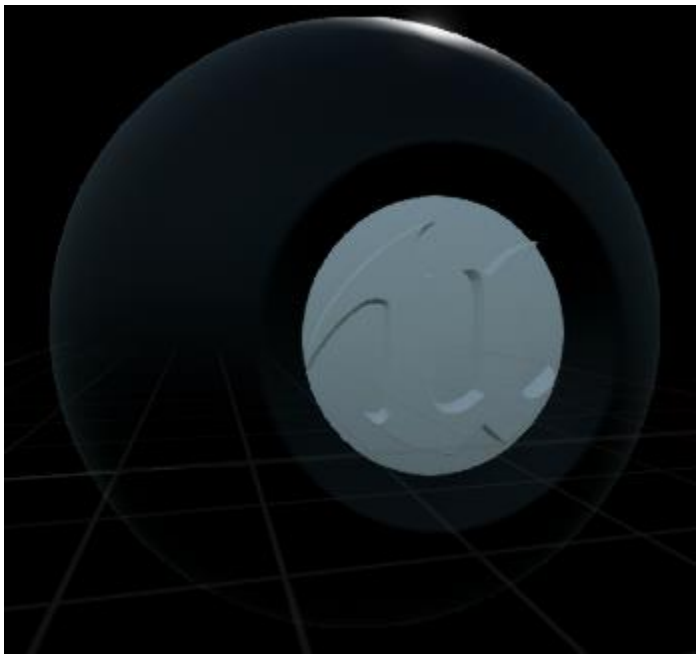

Blackboard Based Condition
(aborts self)
Blackboard: BossState Is Equal To BS_TURRET
1
Selector
Selector
Cooldown
Cooldown: lock for 3.0s after execution and return Failed
0
FireMissles
FireMissles
1
Move To
MoveTo: HomeLocation

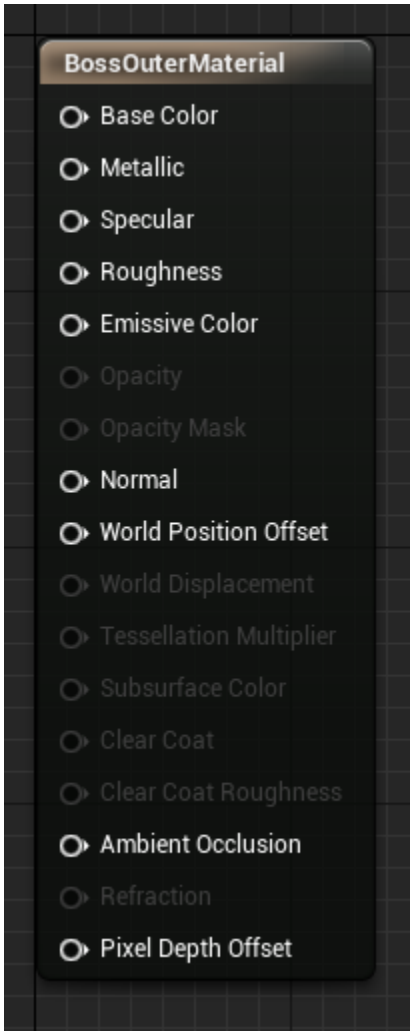

Blackboard Based Condition
Blackboard: BossState Is Equal To Final
2
Selector
Selector
Cooldown
Cooldown: lock for 1.5s after execution and return Failed
0
FireMissiles
FireMissiles
Cooldown
Cooldown: lock for 3.0s after execution and return Failed
1
BMRandomMoveTo
BMRandomMoveTo

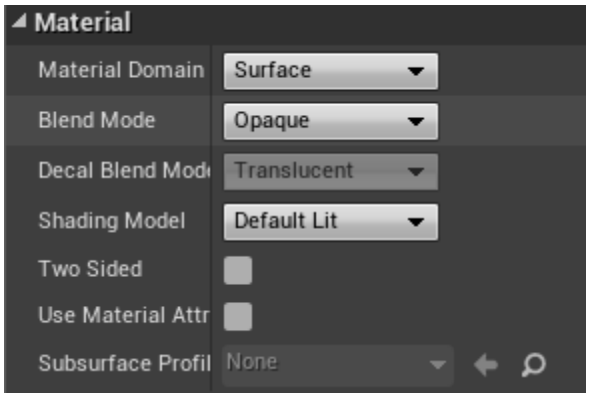


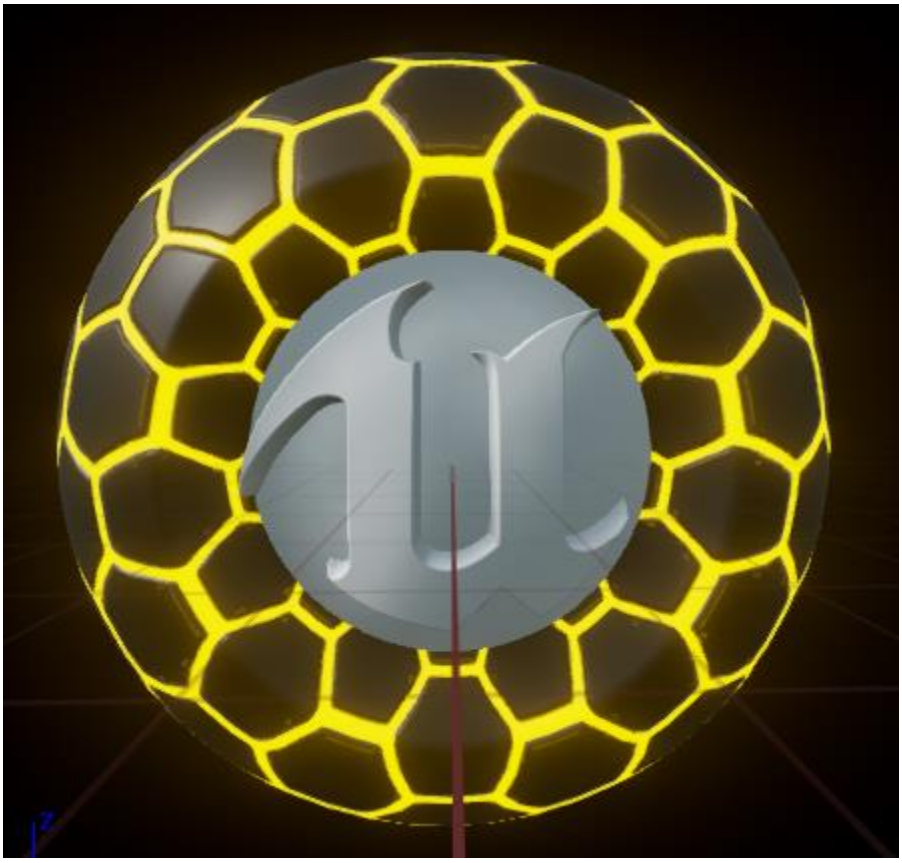

Material
Particle System
Create Advanced Asset
Animation
Blueprints
Materials & Textures
Material
Material Function
Material Instance
Material Parameter Collection

Perspective
Lit
Show

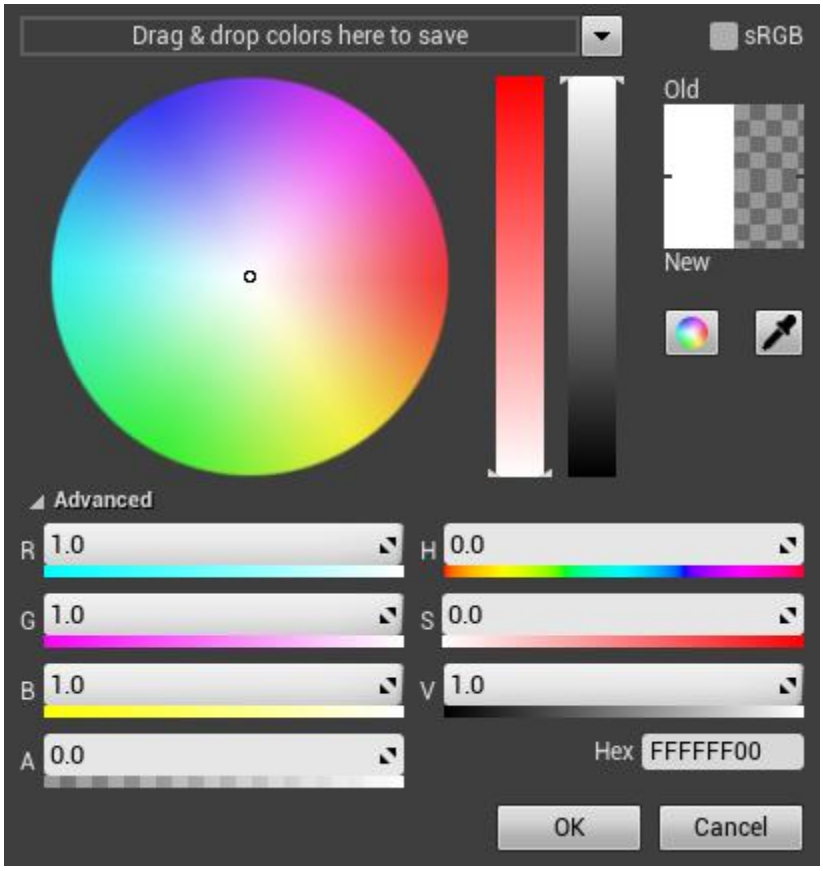


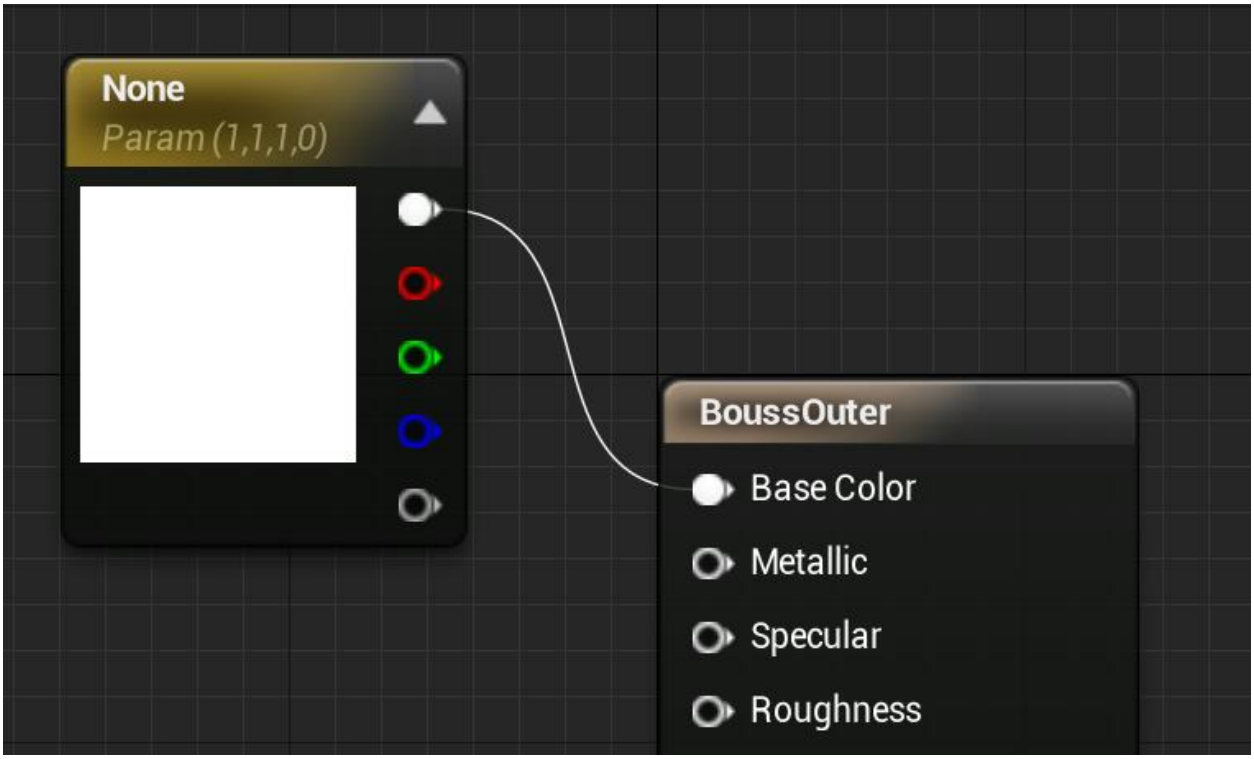

BossOuterMaterial
Base Color
Metallic
Specular
Roughness
Emissive Color
Opacity
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color
Clear Coat
Clear Coat Roughness
Ambient Occlusion
Refraction
Pixel Depth Offset

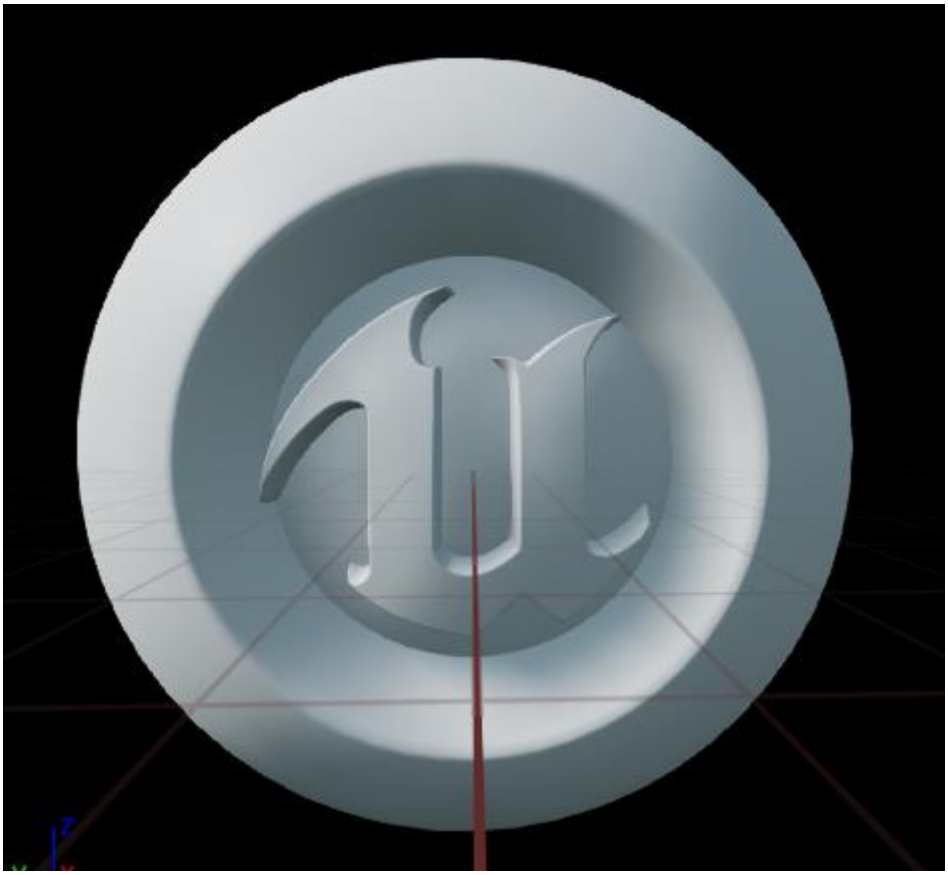

Material
Material Domain
Surface
Blend Mode
Opaque
Decal Blend Mod
Translucent
Shading Model
Default Lit
Two Sided
Use Material Attr
Subsurface Profil
None



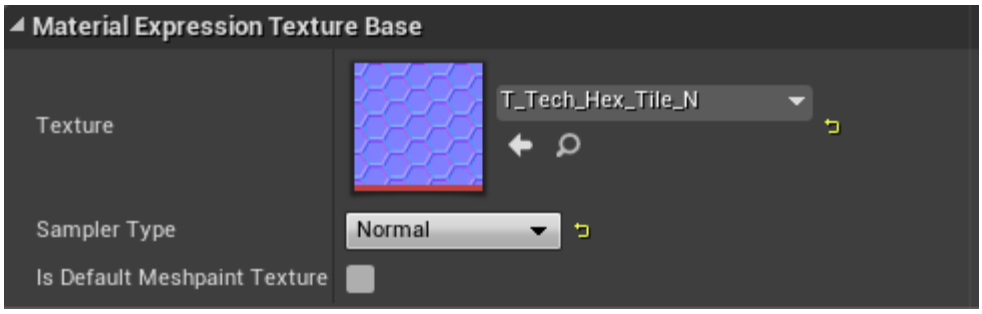
None
Param (0,0,0,0)

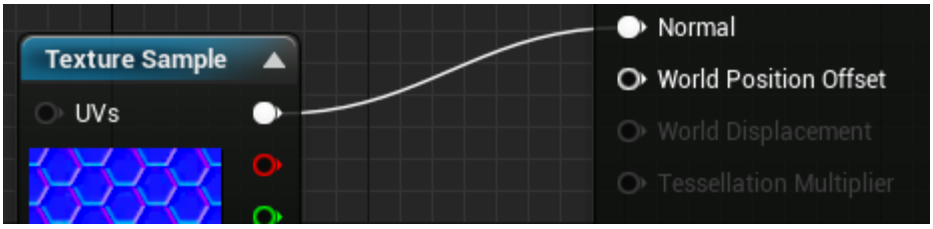

Drag & drop colors here to save
sRGB
Old
New
Advanced
R 1.0
G 1.0
B 1.0
A 0.0
H 0.0
S 0.0
V 1.0
Hex FFFFFF00
OK
Cancel

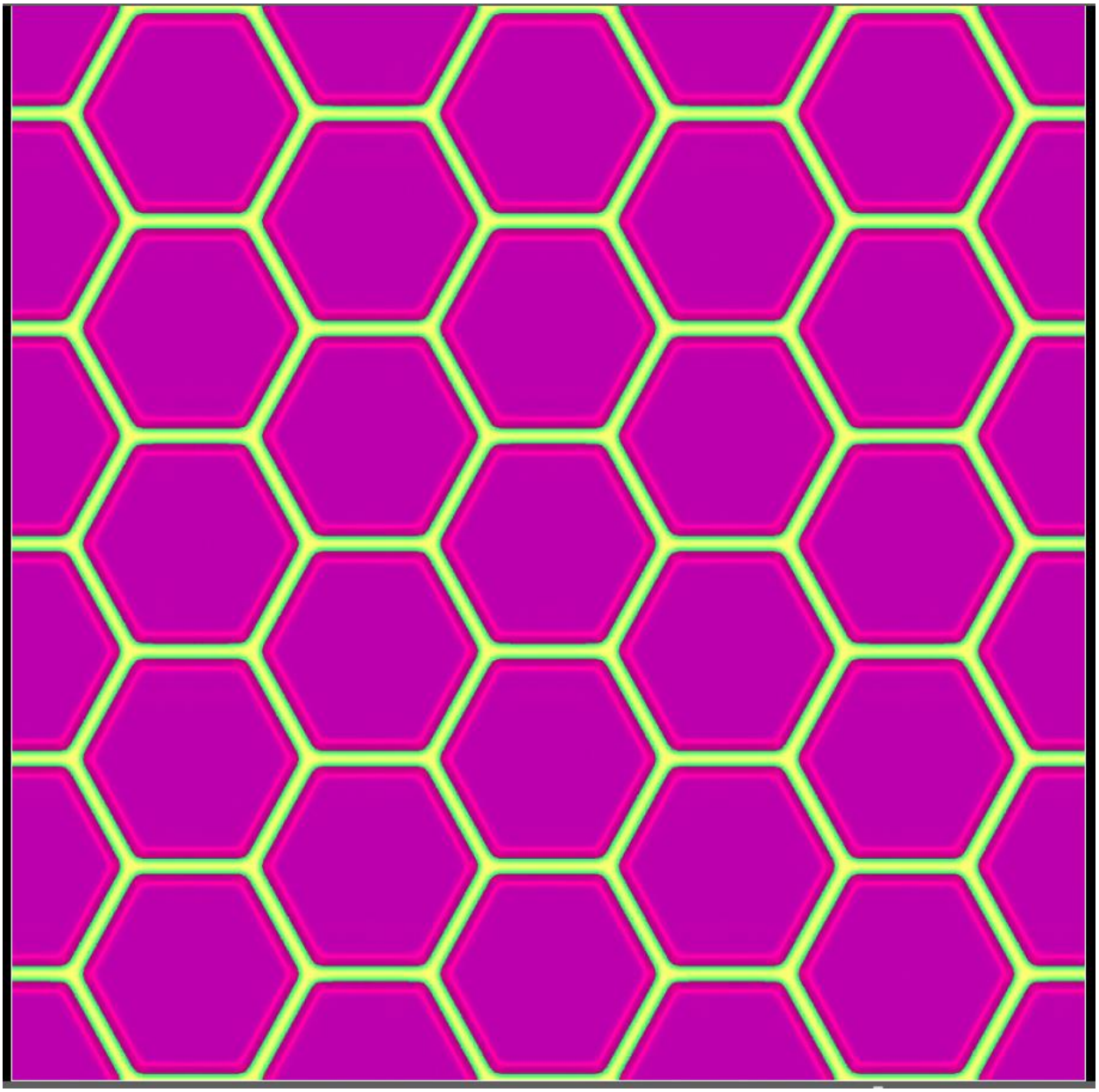

None
Param (1,1,1,0)
BoussOuter
Base Color
Metallic
Specular
Roughness

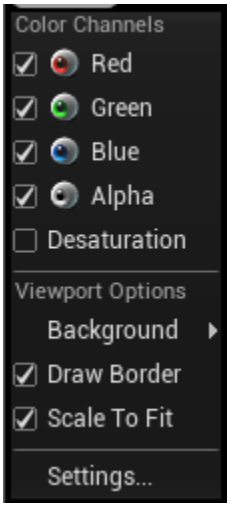


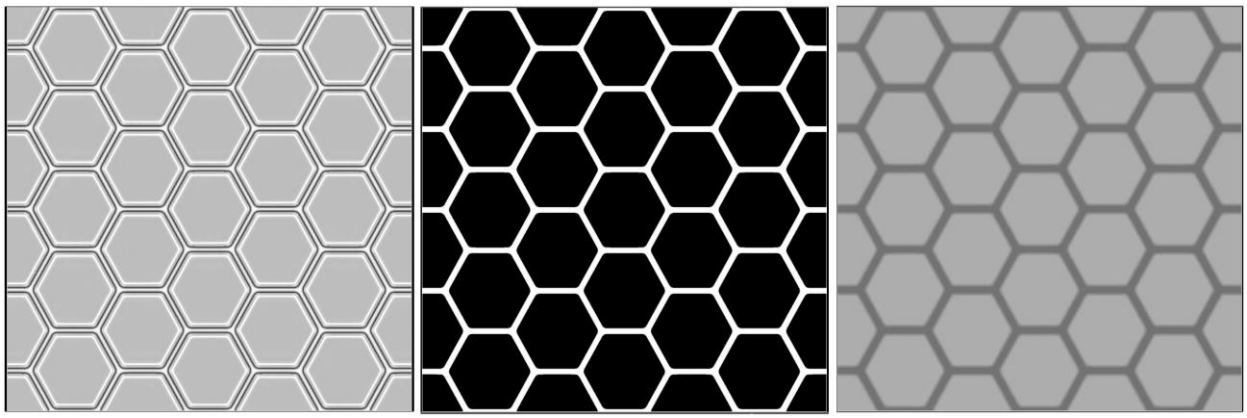
Texture Sample
UVs

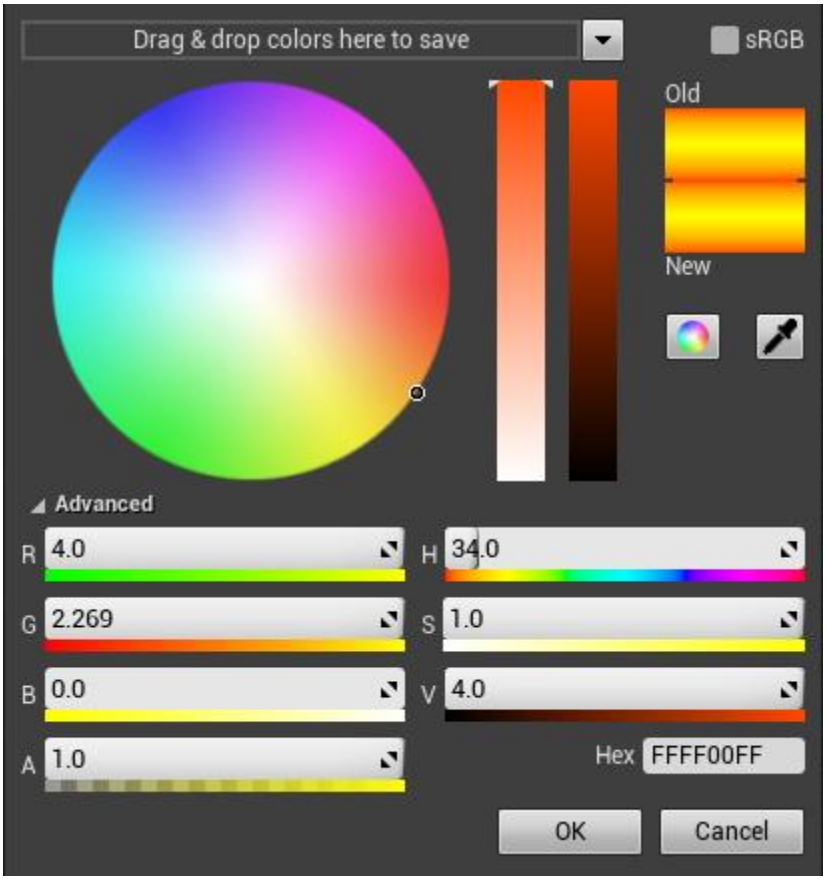

Material Expression Texture Base
Texture
T_Tech_Hex_Tile_N
Sampler Type
Normal
Is Default Meshpaint Texture

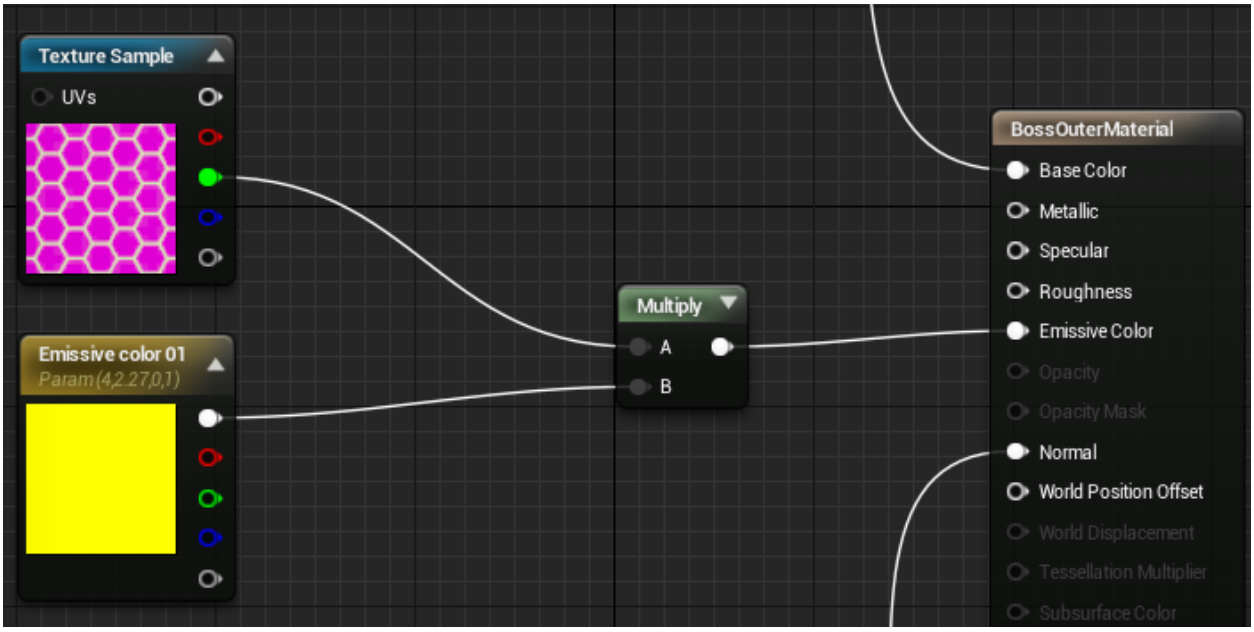

Texture Sample
UVs
Normal
World Position Offset
World Displacement
Tessellation Multiplier

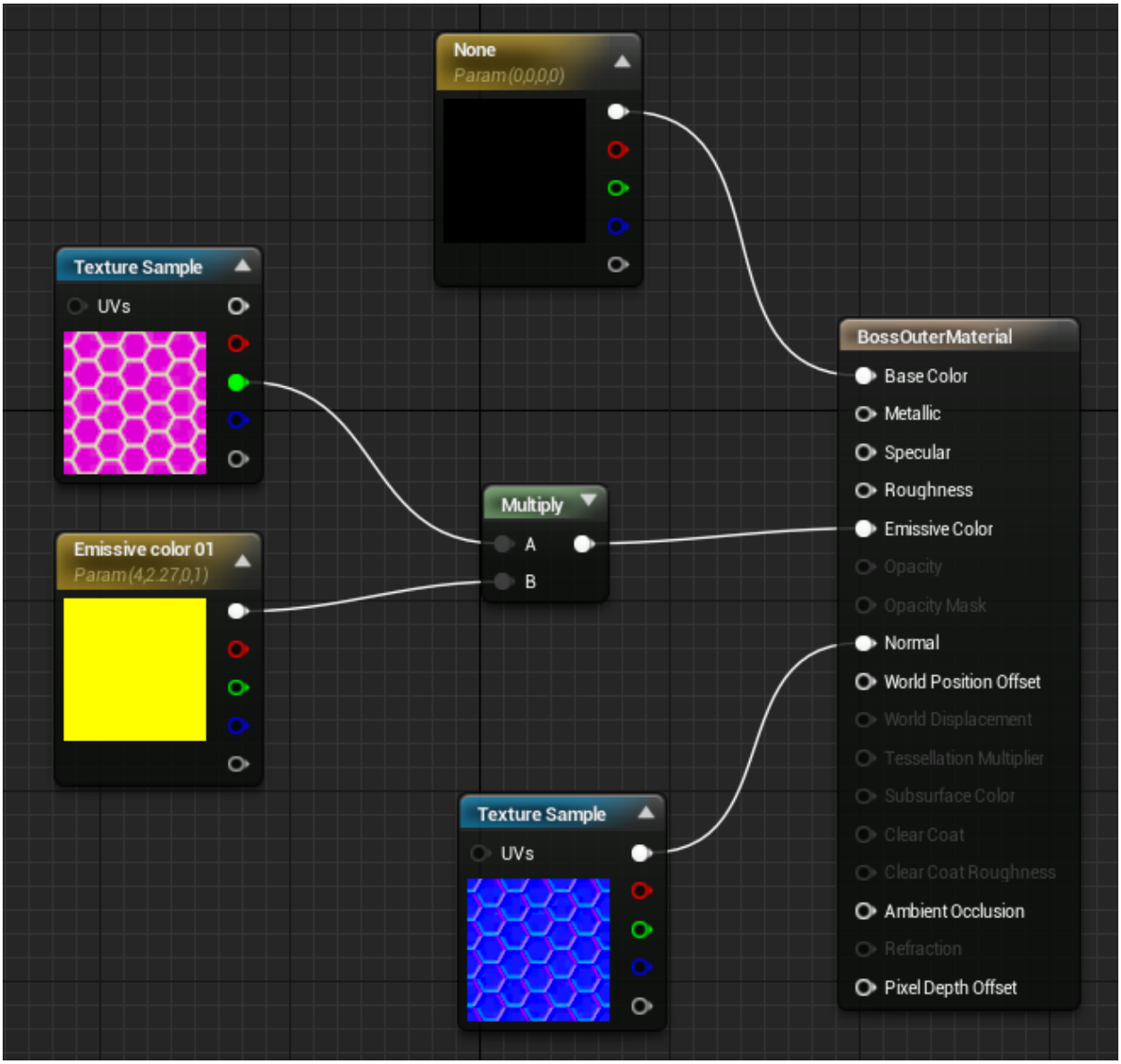


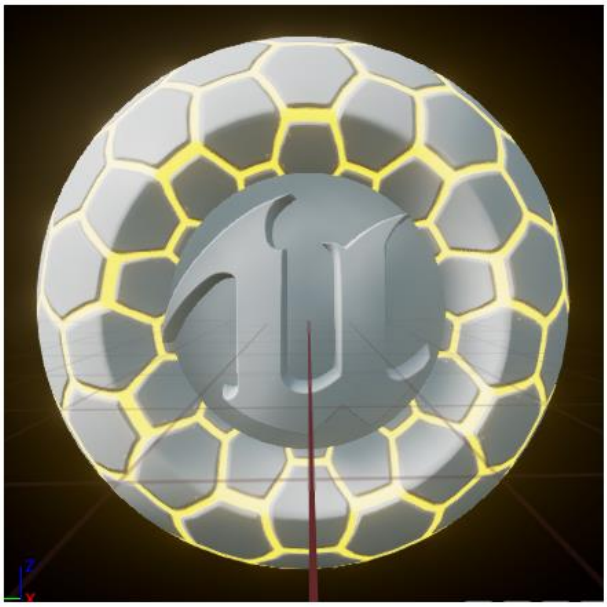

Color Channels
Red
Green
Blue
Alpha
Desaturation
Viewport Options
Background
Draw Border
Scale To Fit
Settings...

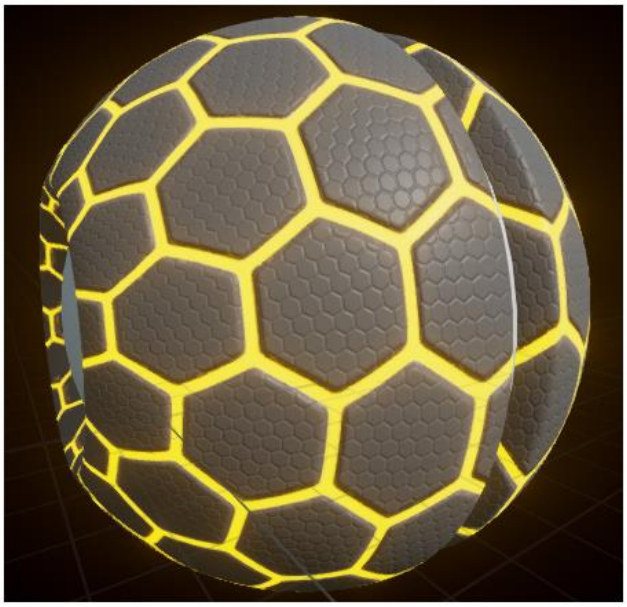


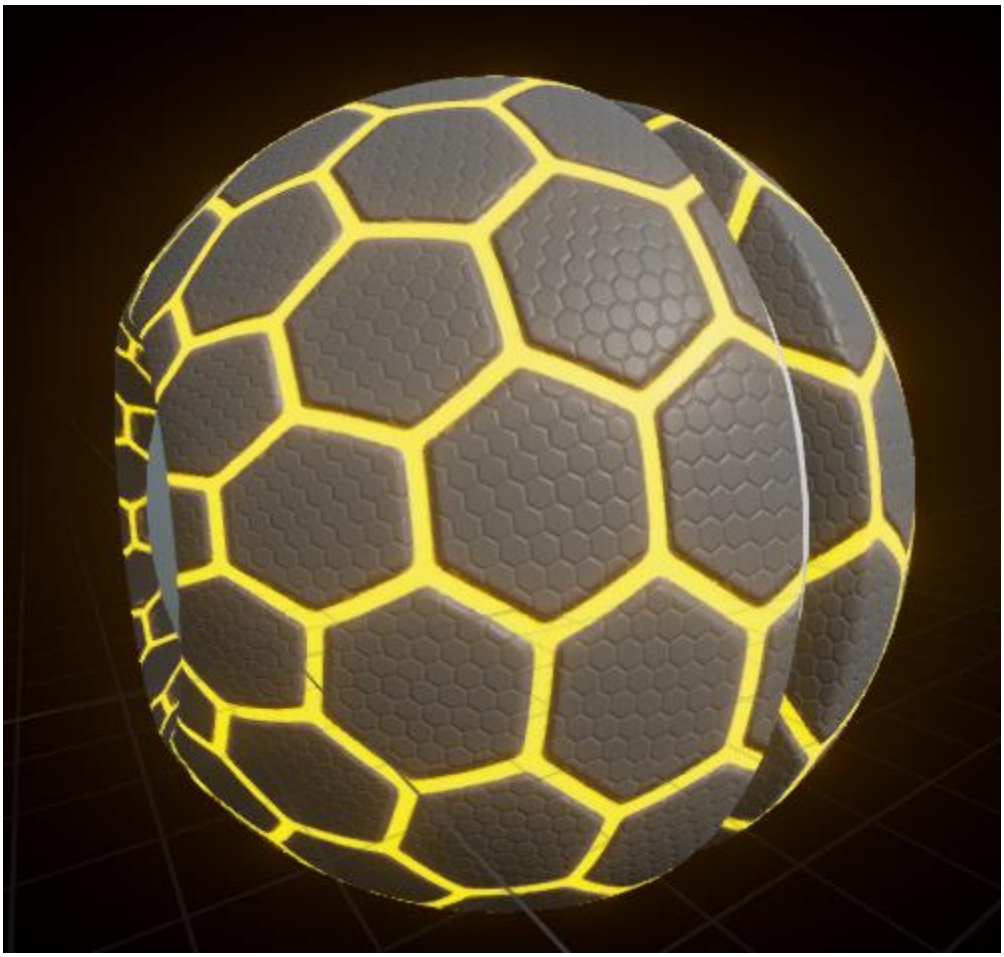

Drag & drop colors here to save
sRGB
Old
New
Advanced
R 4.0
G 2.269
B 0.0
A 1.0
H 34.0
S 1.0
V 4.0
Hex FFFF00FF
OK
Cancel

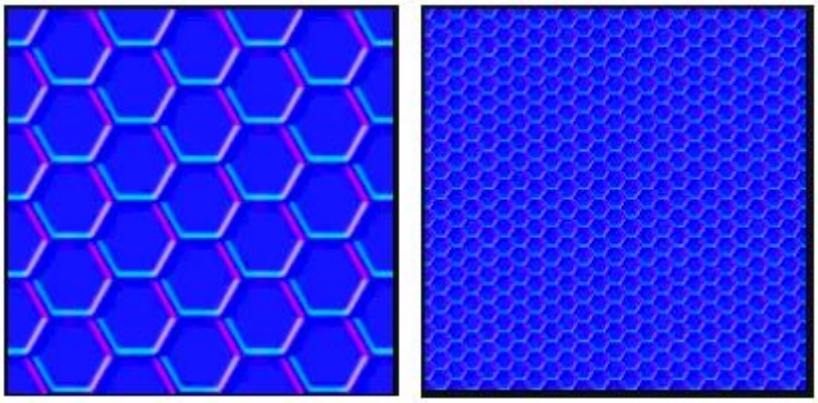

Texture Sample
UVs
Emissive color 01
Param (4,2.27,0,1)
Multiply
A
B
BossOuterMaterial
Base Color
Metallic
Specular
Roughness
Emissive Color
Opacity
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color

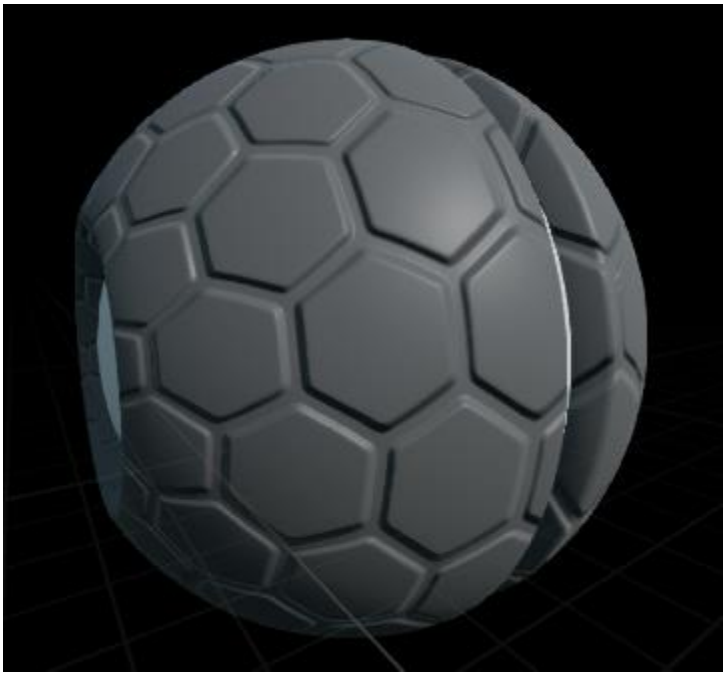

None
Param (0,0,0,0)
Texture Sample
UVs
Multiply
A
B
Emissive color 01
Param (4,2.27,0,1)
Texture Sample
UVs
BossOuterMaterial
Base Color
Metallic
Specular
Roughness
Emissive Color
Opacity
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color
Clear Coat
Clear Coat Roughness
Ambient Occlusion
Refraction
Pixel Depth Offset

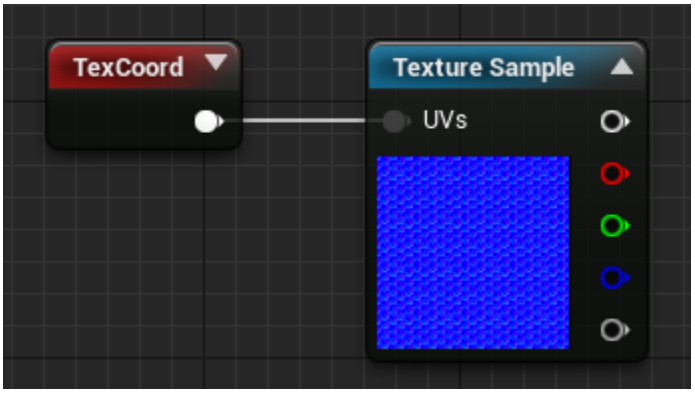


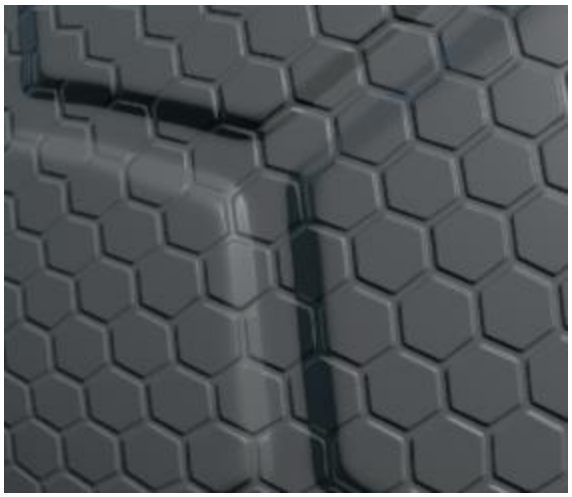




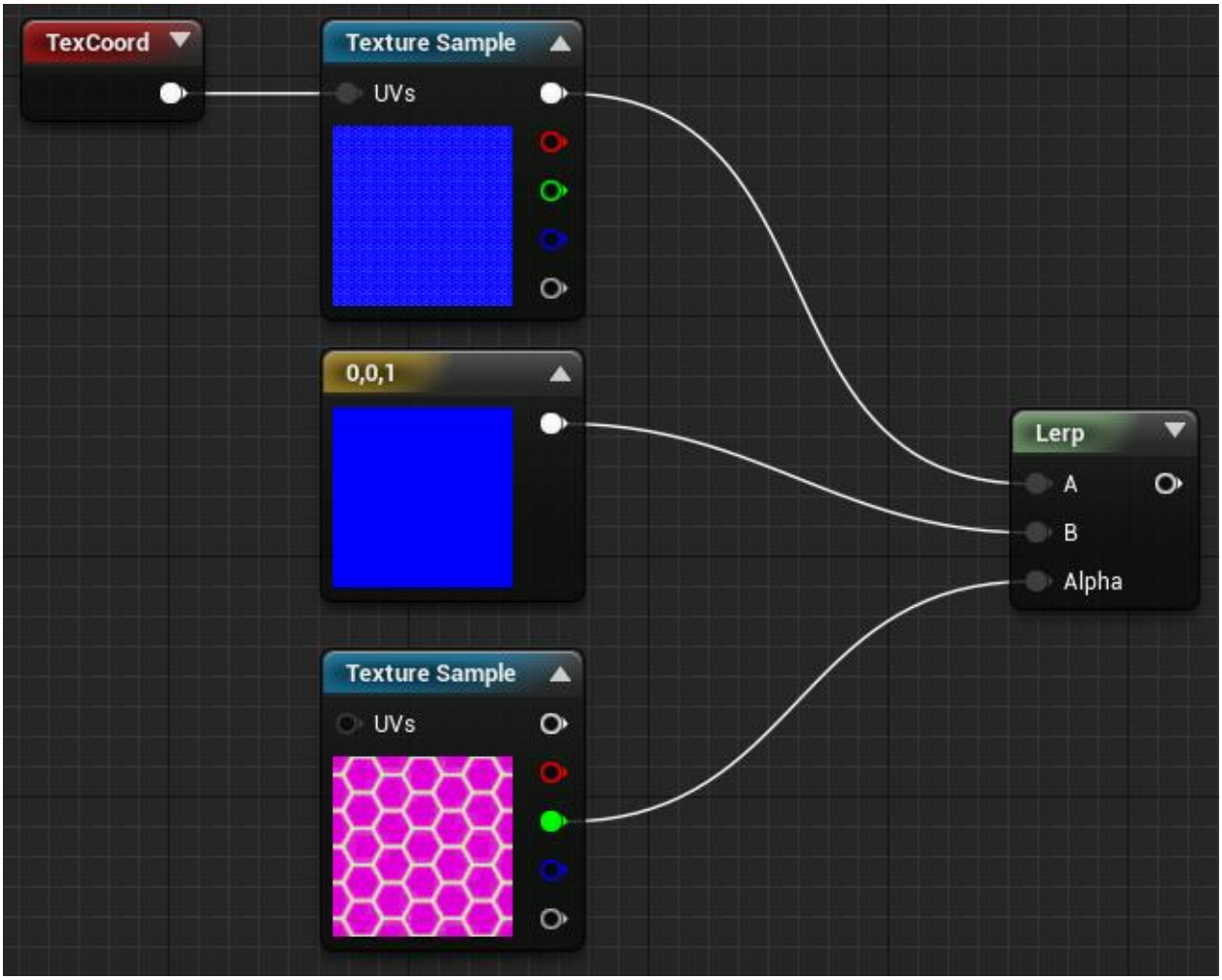


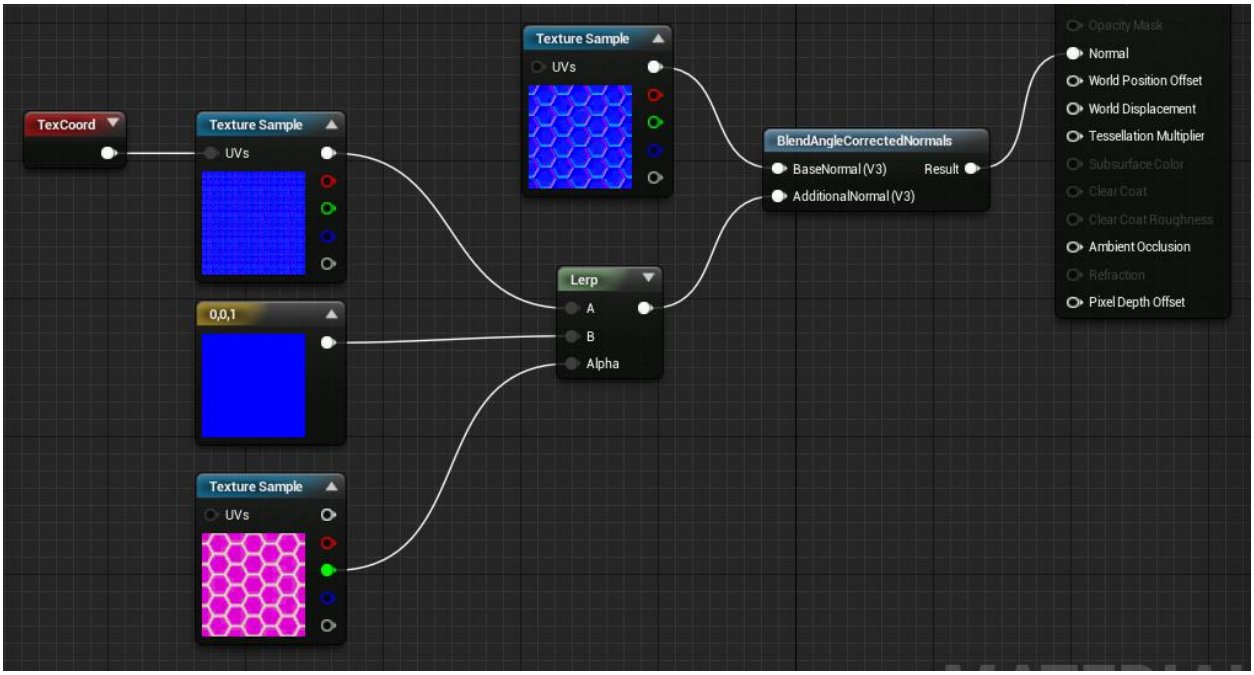


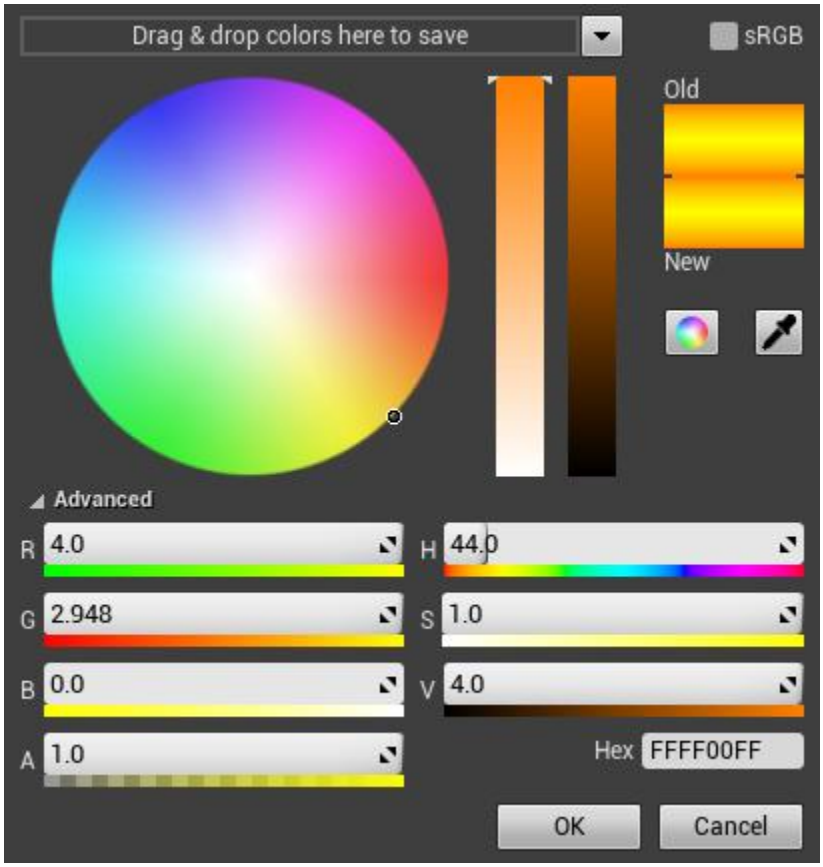

TexCoord
Texture Sample
UVs

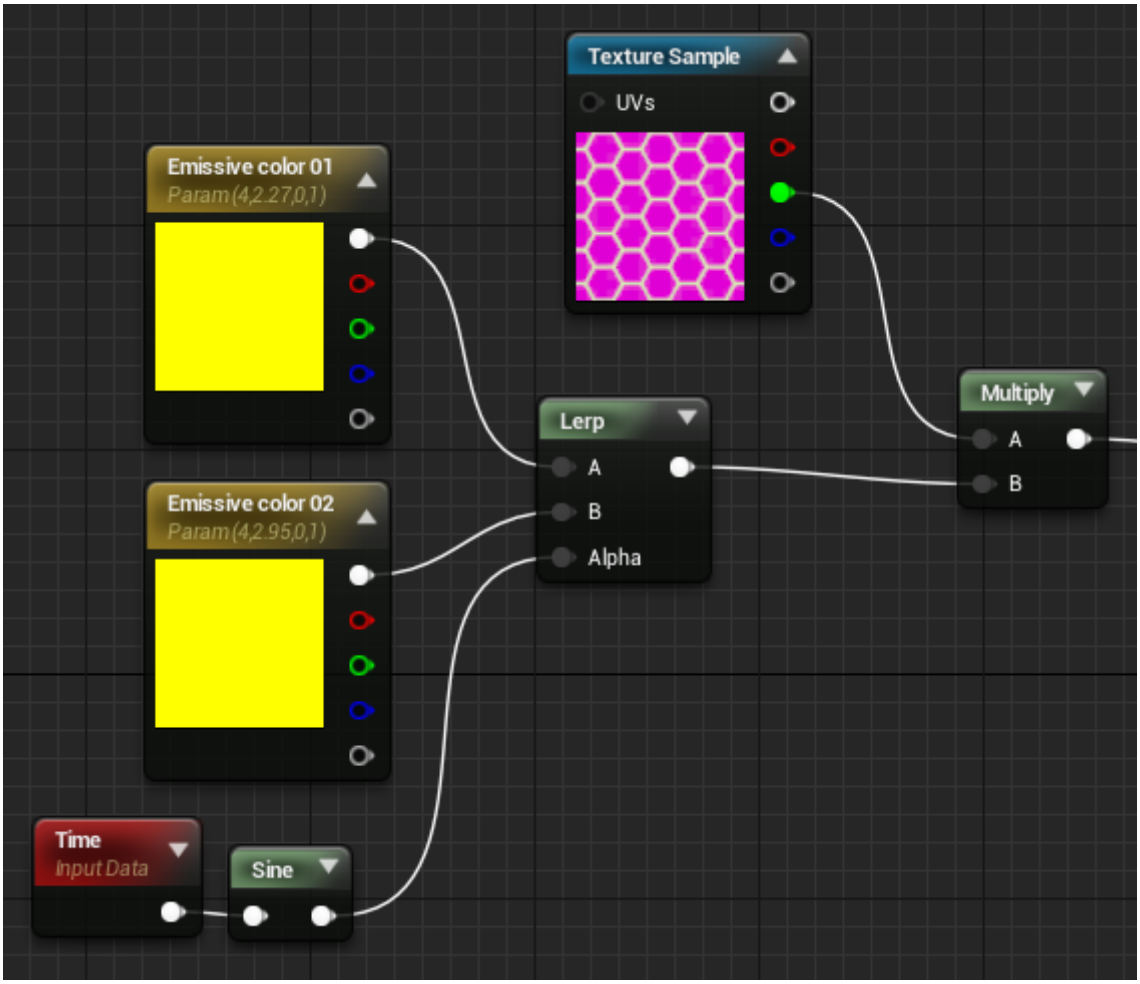


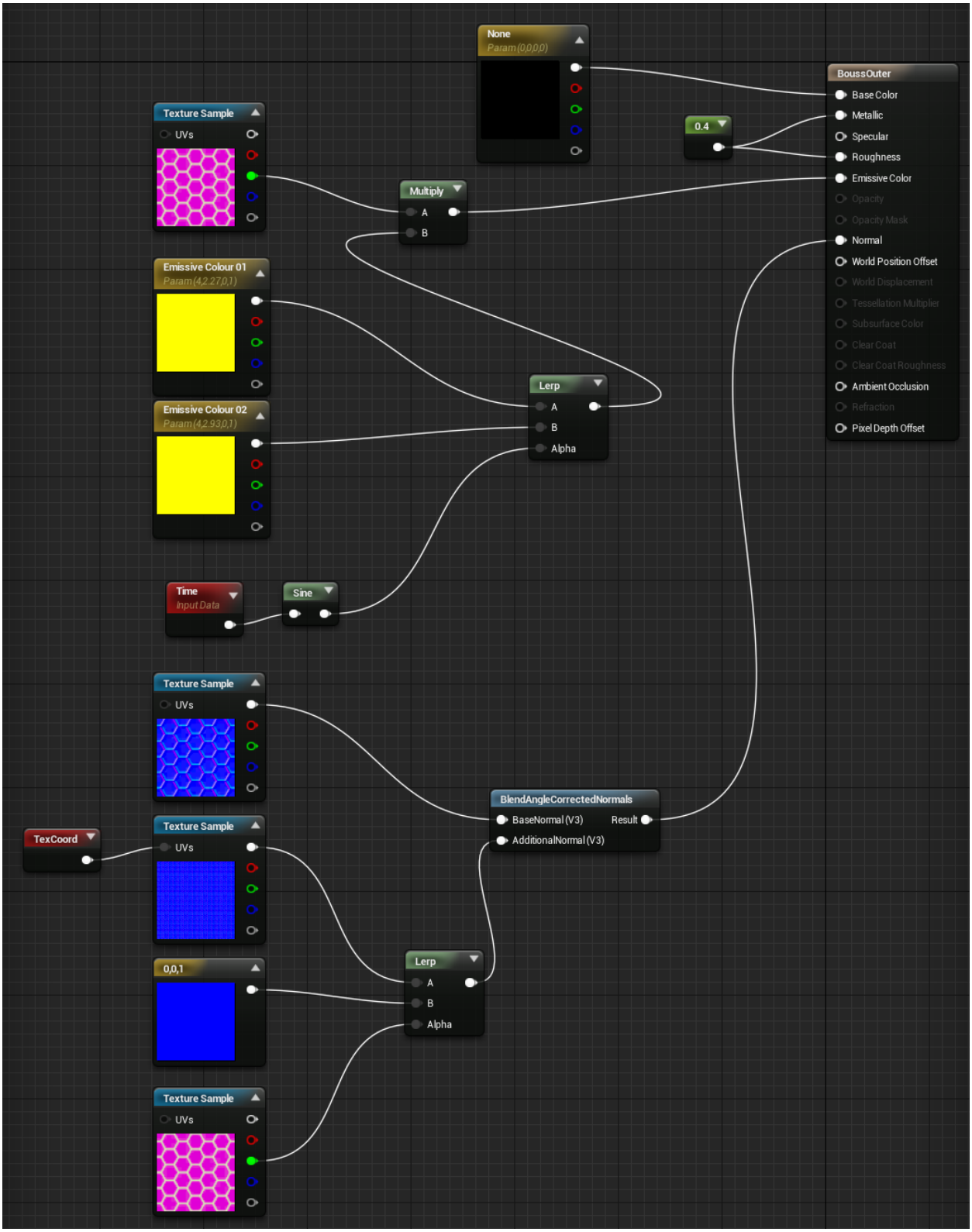
Advanced
R
0.0
G
0.0
B
1.0

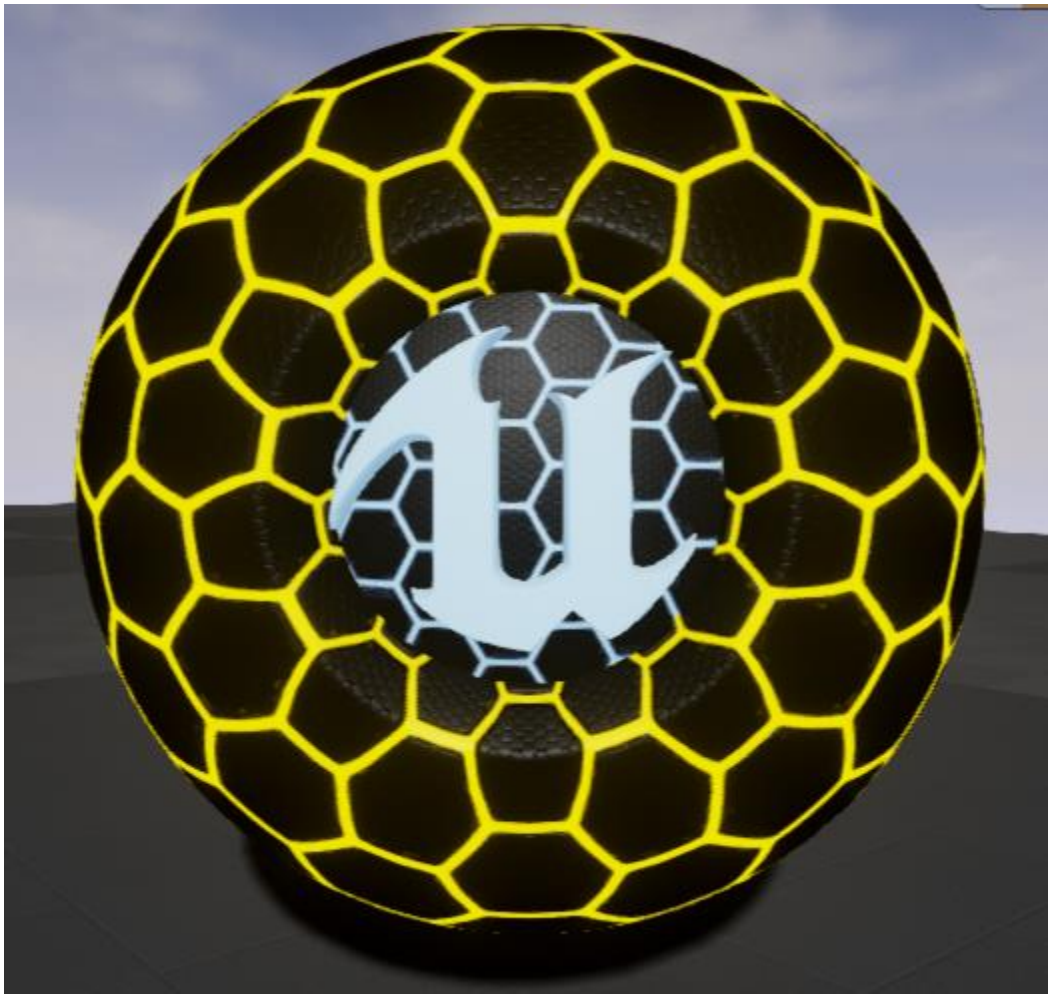

TexCoord
Texture Sample
UVs
0,0,1
Lerp
A
B
Alpha
Texture Sample
UVs

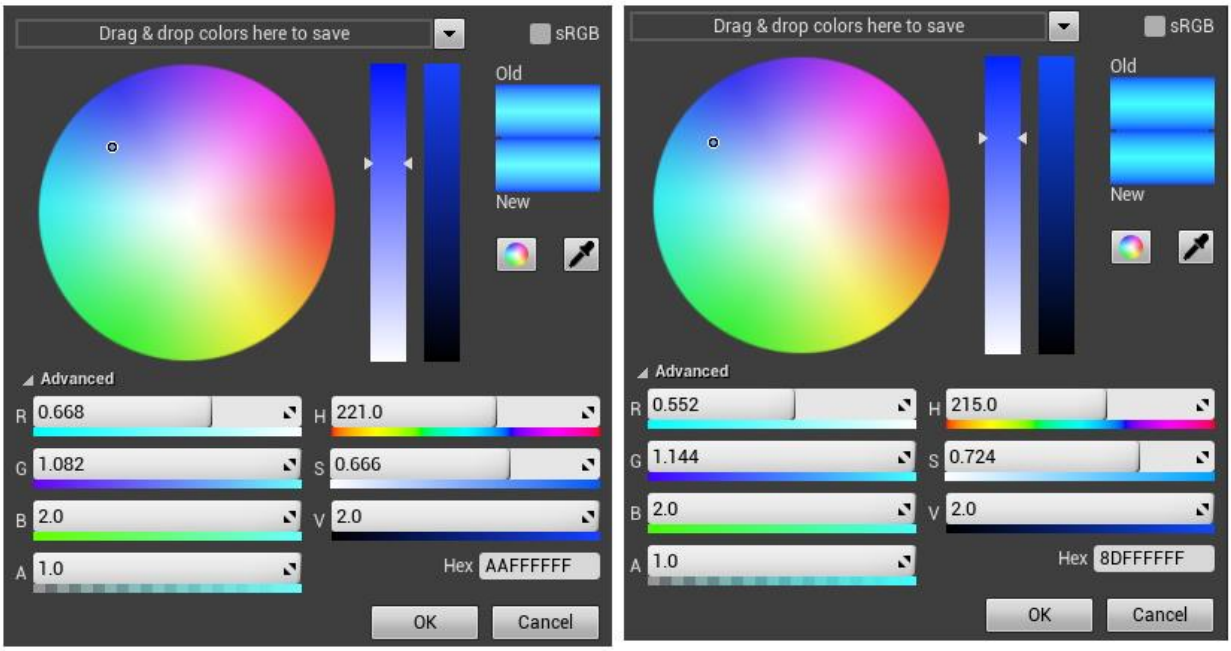

TexCoord
Texture Sample
UVs
Texture Sample
UVs
BlendAngleCorrectedNormals
BaseNormal (V3)
Result
AdditionalNormal (V3)
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color
Clear Coat
Clear Coat Roughness
Ambient Occlusion
Refraction
Pixel Depth Offset
Lerp
A
B
Alpha
0,0,1
Texture Sample
UVs

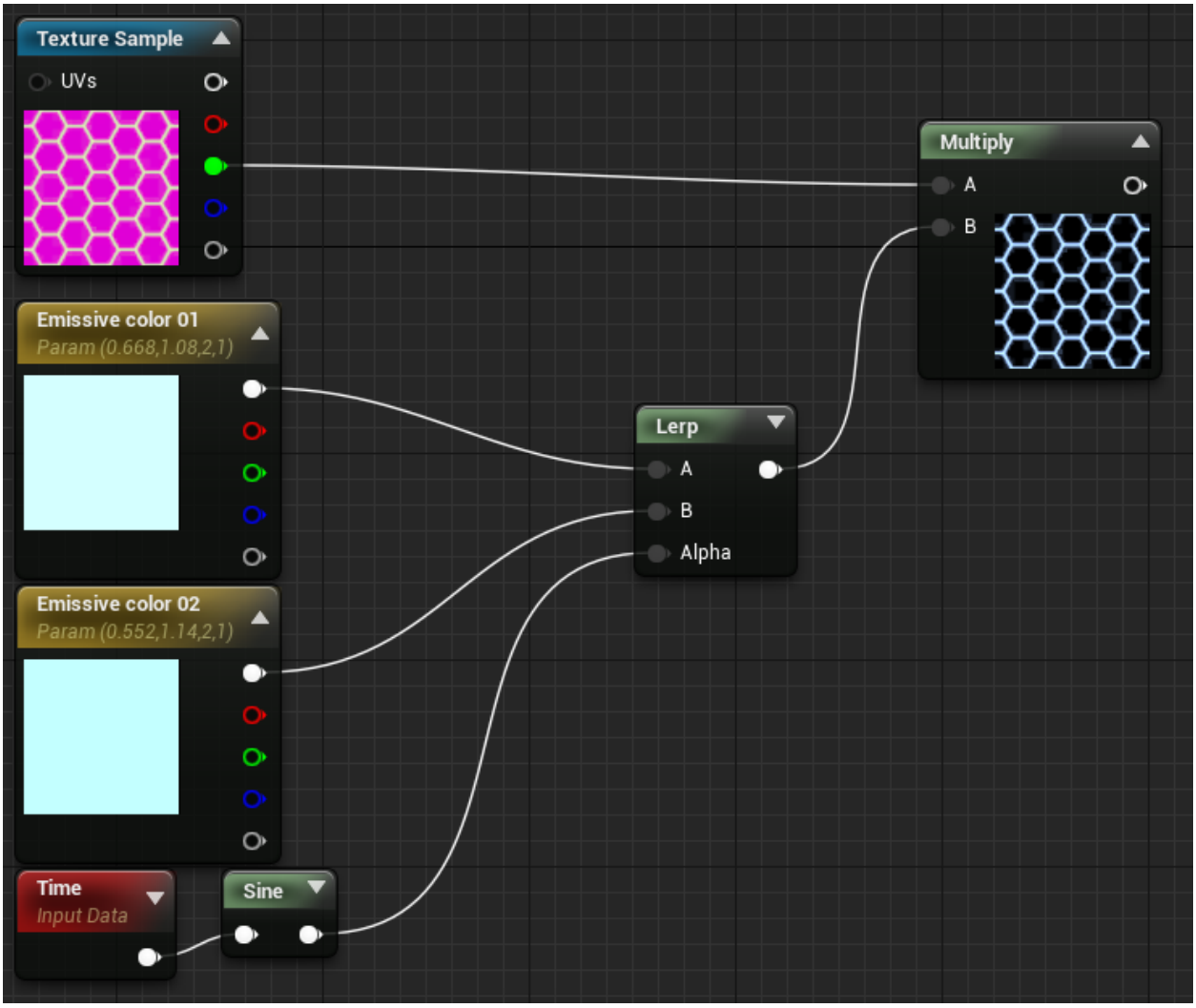

Drag & drop colors here to save
sRGB
Old
New
Advanced
R 4.0
G 2.948
B 0.0
A 1.0
H 44.0
S 1.0
V 4.0
Hex FFFF00FF
OK
Cancel

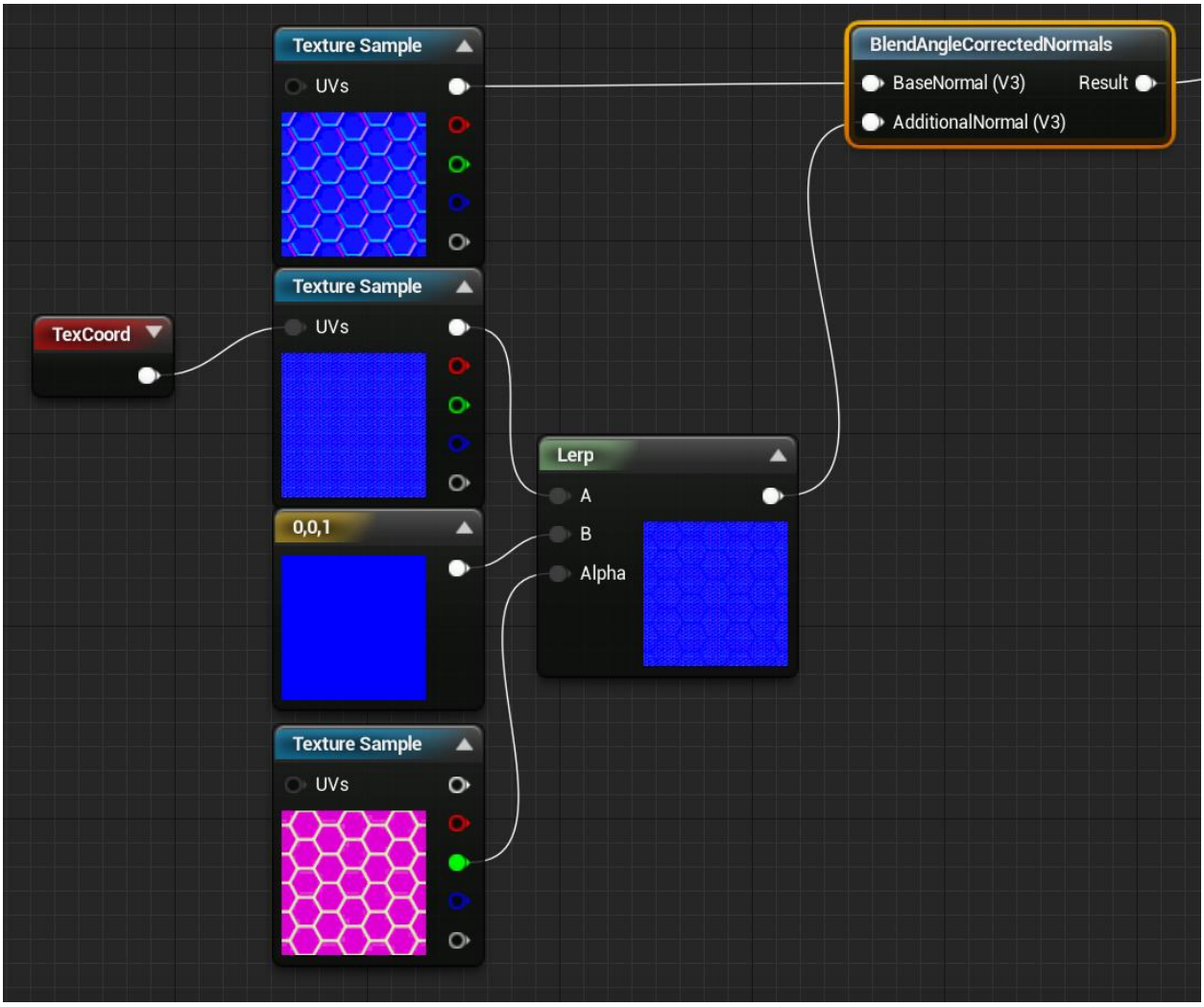

Texture Sample
UVs
Emissive color 01
Param (4,2.27,0,1)
Emissive color 02
Param (4,2.95,0,1)
Lerp
A
B
Alpha
Multiply
A
B
Time
Input Data
Sine

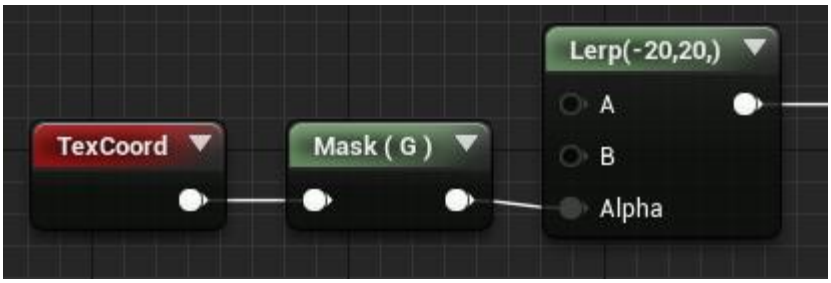

None
Param(0,0,0,0)
BoussOuter
Base Color
Metallic
Specular
Roughness
Emissive Color
Opacity
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color
Clear Coat
Clear Coat Roughness
Ambient Occlusion
Refraction
Pixel Depth Offset
0.4
Texture Sample
UVs
Multiply
A
B
Emissive Colour 01
Param(4,2.27,0,1)
Emissive Colour 02
Param(4,2.93,0,1)
Lerp
A
B
Alpha
Time
Input Data
Sine
Texture Sample
UVs
BlendAngleCorrectedNormals
BaseNormal (V3)
Result
AdditionalNormal (V3)
TexCoord
Texture Sample
UVs
0,0,1
Lerp
A
B
Alpha
Texture Sample
UVs

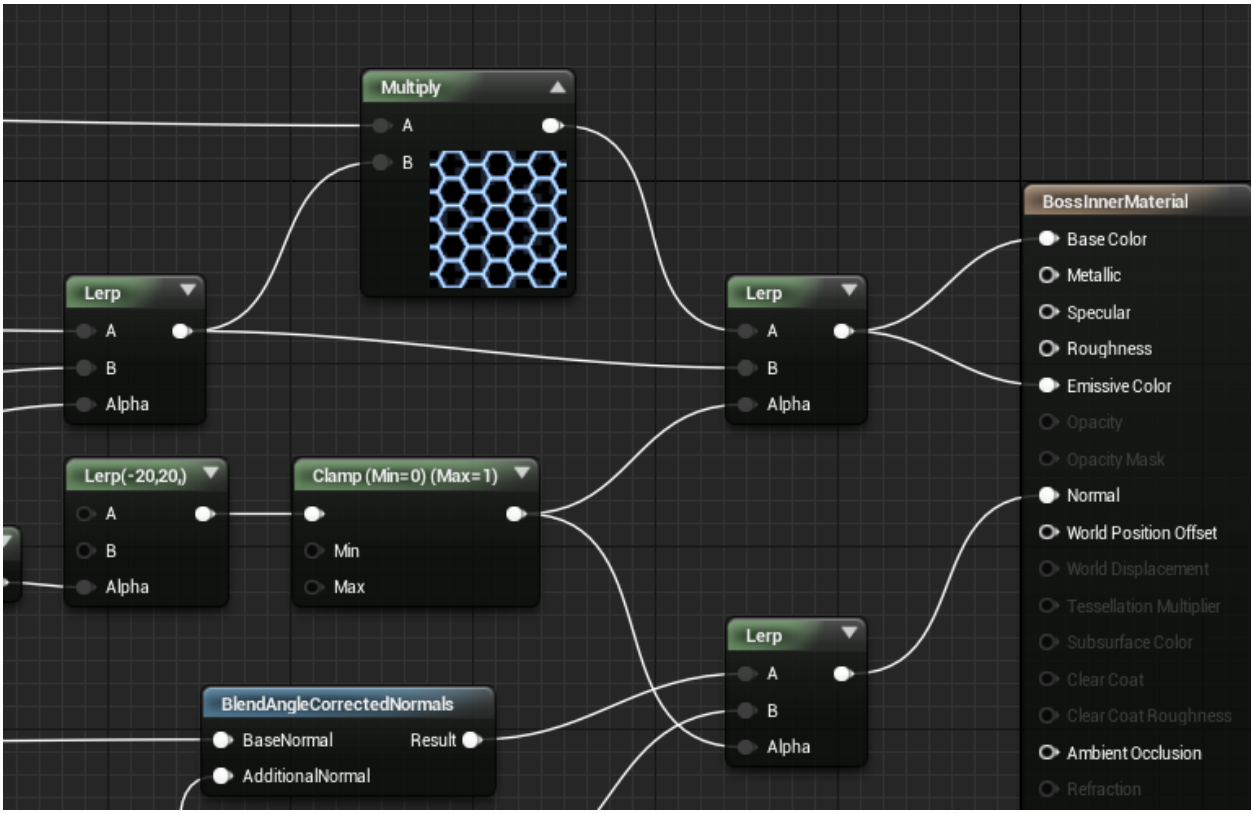


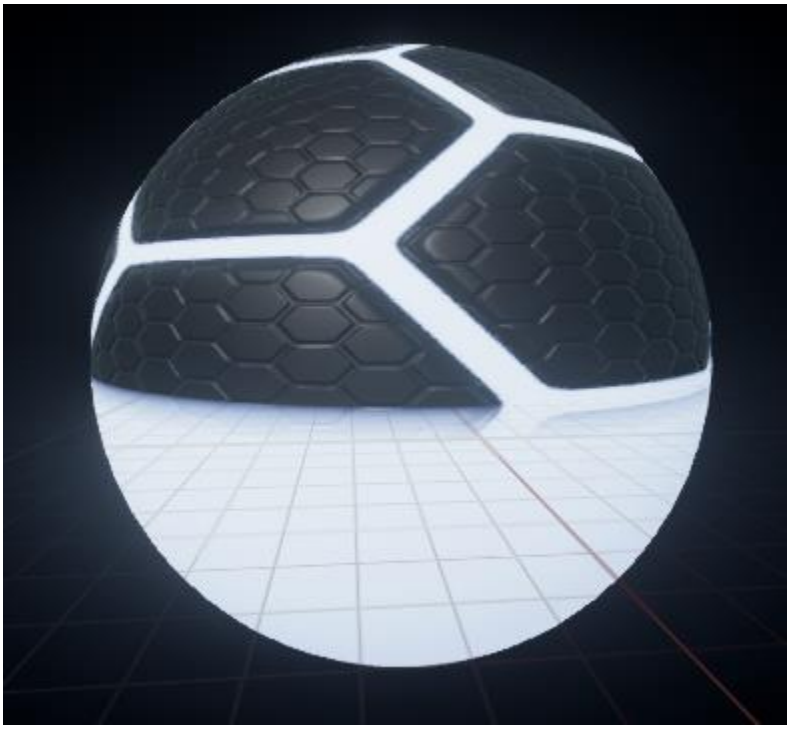

Drag & drop colors here to save
sRGB
Old
New
Advanced
R 0.668
G 1.082
B 2.0
A 1.0
H 221.0
S 0.666
V 2.0
Hex AAFFFFFF
OK
Cancel
Drag & drop colors here to save
sRGB
Old
New
Advanced
R 0.552
G 1.144
B 2.0
A 1.0
H 215.0
S 0.724
V 2.0
Hex 8DFFFFFF
OK
Cancel

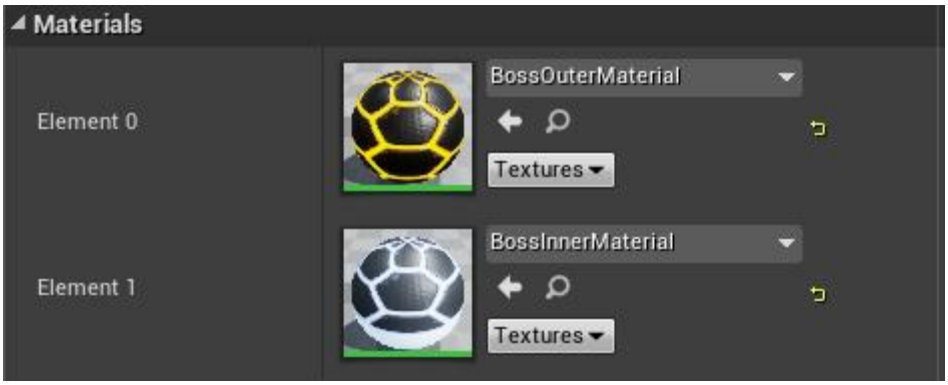

Texture Sample
UVs
Multiply
A
B
Emissive color 01
Param (0.668,1.08,2,1)
Lerp
A
B
Alpha
Emissive color 02
Param (0.552,1.14,2,1)
Time
Input Data
Sine

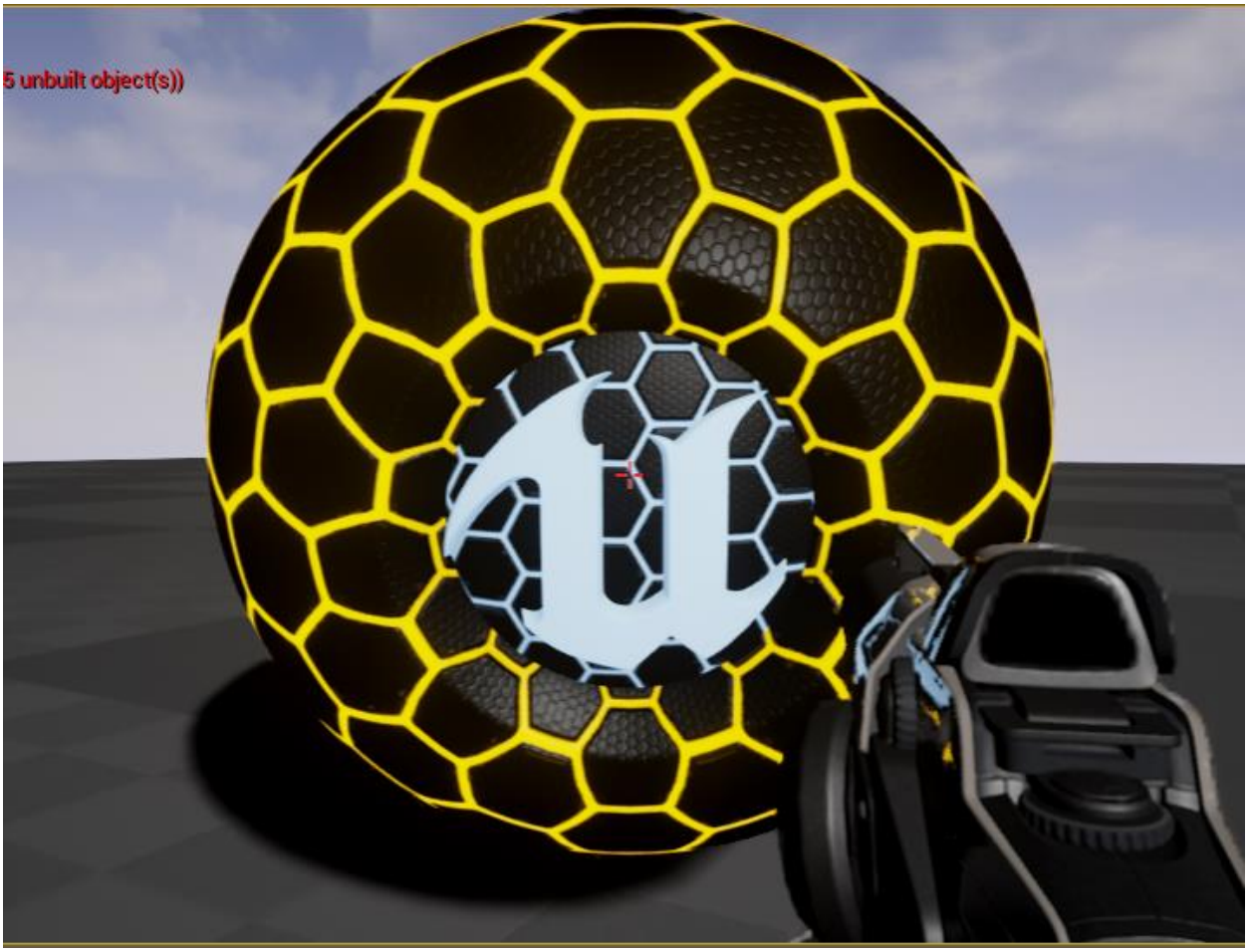

Texture Sample
UVs
BlendAngleCorrectedNormals
BaseNormal (V3)
Result
AdditionalNormal (V3)
Texture Sample
TexCoord
UVs
Lerp
A
B
Alpha
0,0,1
Texture Sample
UVs


Lerp(-20,20,)
TexCoord
Mask (G)
A
B
Alpha

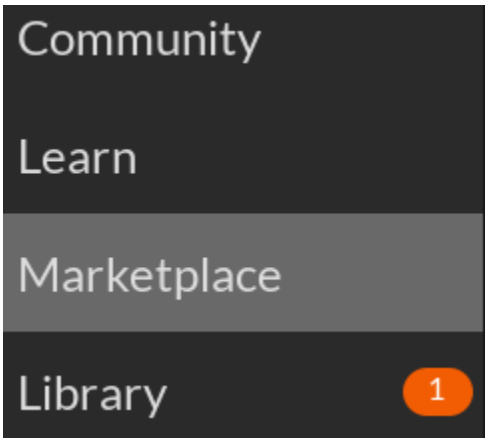

Multiply
A
B
Lerp
A
B
Alpha
Lerp
A
B
Alpha
BossInnerMaterial
Base Color
Metallic
Specular
Roughness
Emissive Color
Opacity
Opacity Mask
Normal
World Position Offset
World Displacement
Tessellation Multiplier
Subsurface Color
Clear Coat
Clear Coat Roughness
Ambient Occlusion
Refraction
Lerp(-20,20,)
A
B
Alpha
Clamp (Min=0) (Max=1)
Min
Max
Lerp
A
B
Alpha
BlendAngleCorrectedNormals
BaseNormal
Result
AdditionalNormal

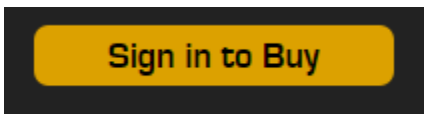



Materials
Element 0
BossOuterMaterial
Textures
Element 1
BossInnerMaterial
Textures

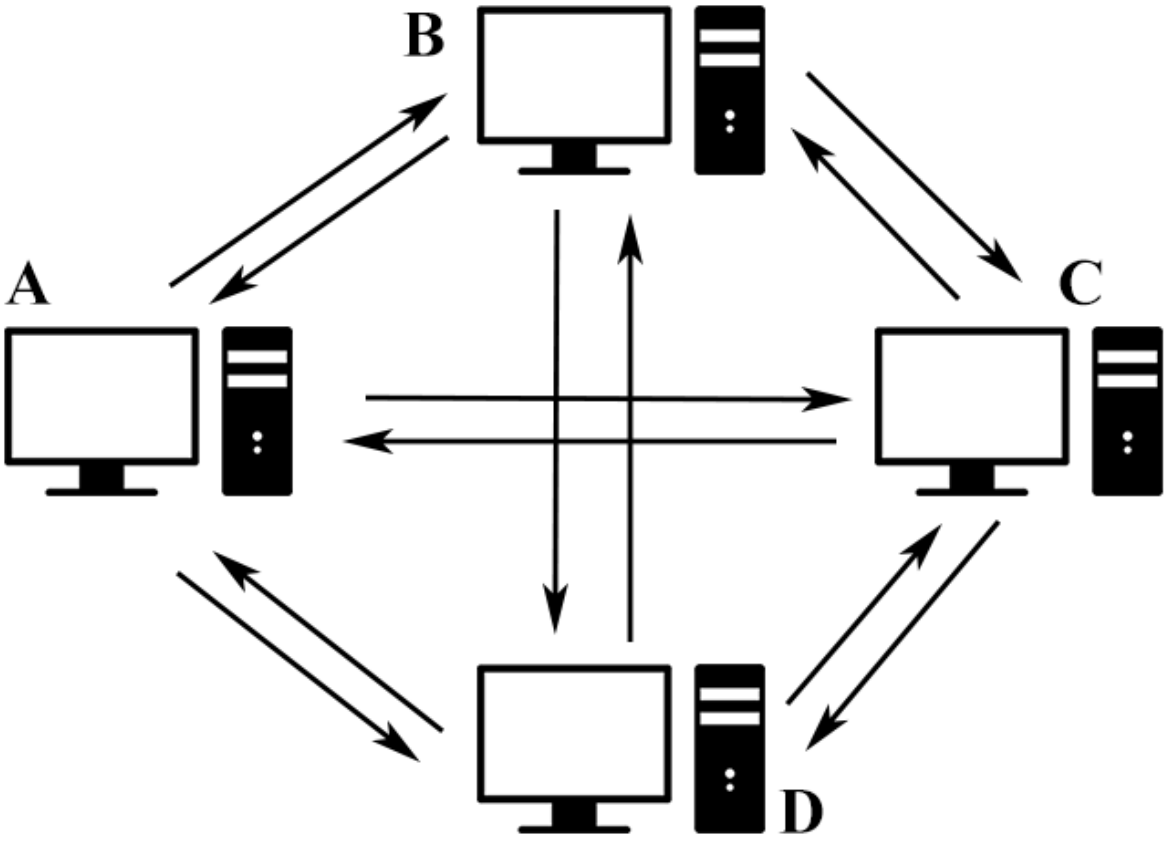

5 unbuilt object(s))

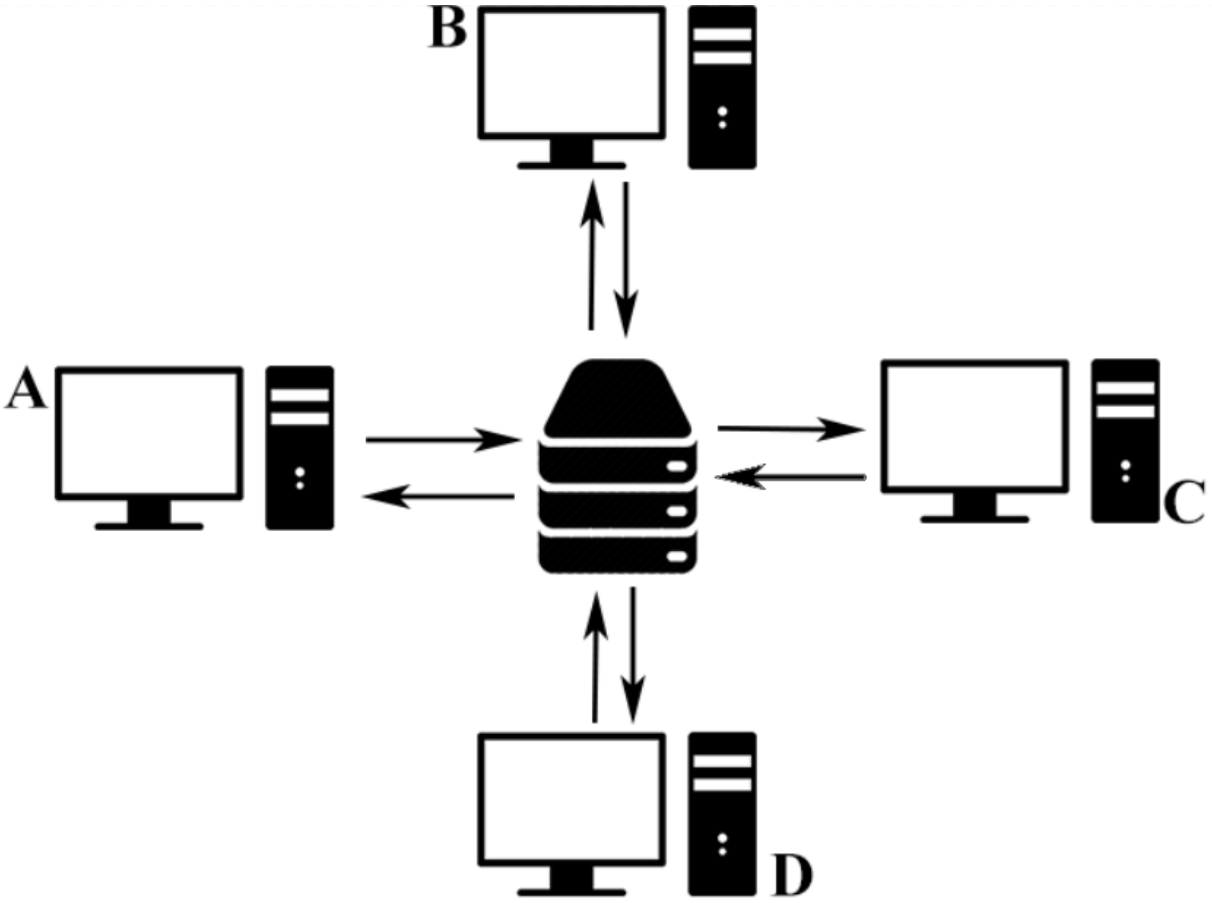
Chapter 9: Creating a Networked Shooter



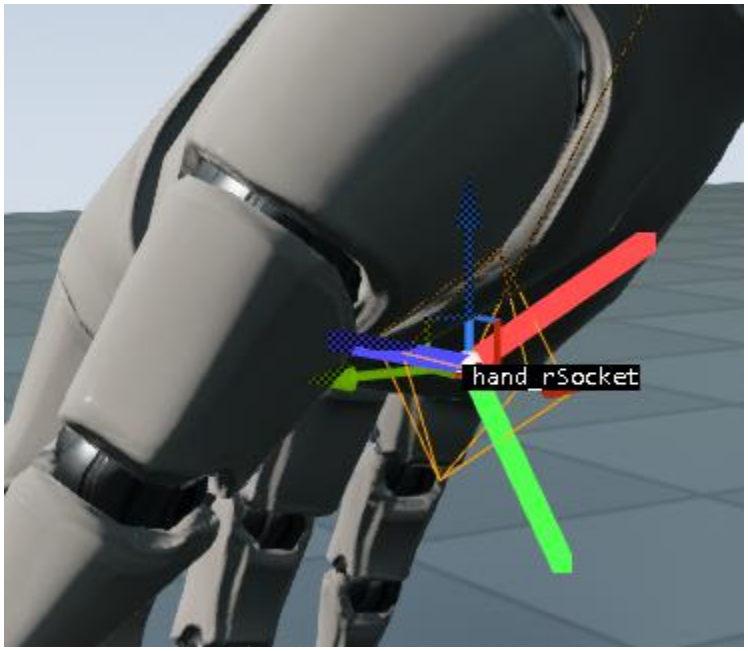


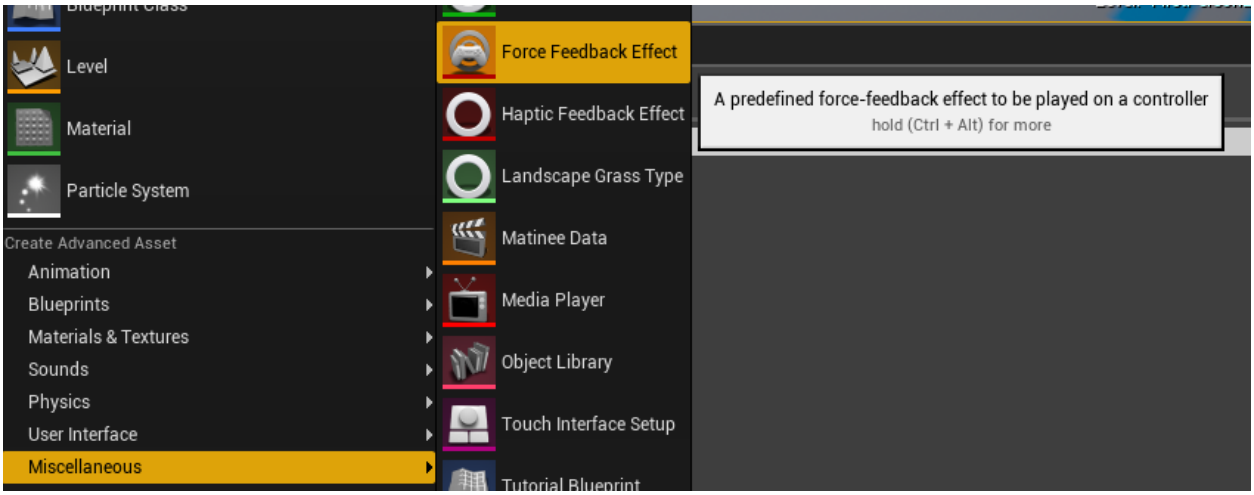
Animation Starter Pack
Add To Project
Cache Size: 24.2 MB

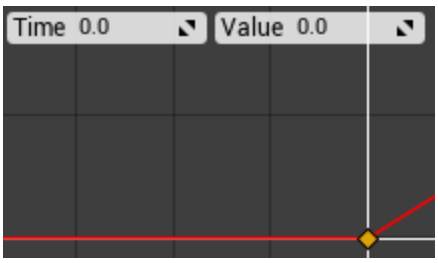


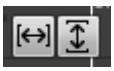


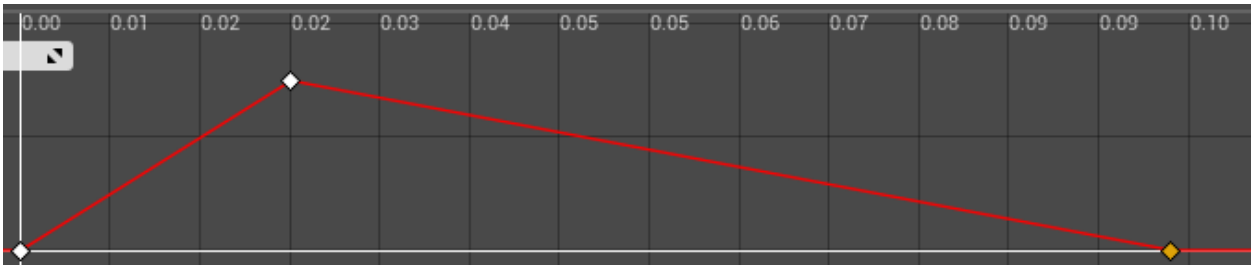
- root
  - pelvis
    - spine_01
      - spine_02
        - spine_03
          - clavicle_l
            - upperarm_l
              - lowerarm_l
                - hand_l
                  - index_01_l
                    - index_02_l
                      - index_03_l
                  - middle_01_l
                    - middle_02_l
                      - middle_03_l
                  - pinky_01_l
                    - pinky_02_l
                      - pinky_03_l
                  - ring_01_l
                    - ring_02_l
                      - ring_03_l

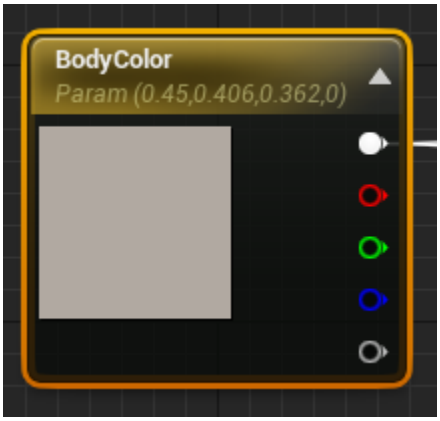

hand_rSocket

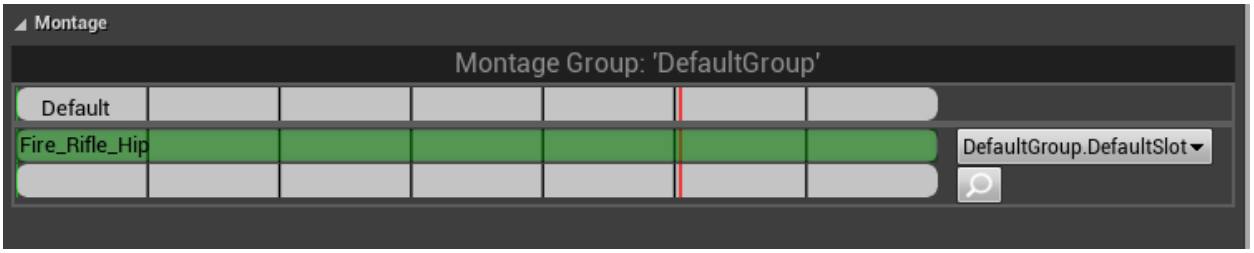

Level
Material
Particle System
Create Advanced Asset
Animation
Blueprints
Materials & Textures
Sounds
Physics
User Interface
Miscellaneous
Force Feedback Effect
Haptic Feedback Effect
Landscape Grass Type
Matinee Data
Media Player
Object Library
Touch Interface Setup
A predefined force-feedback effect to be played on a controller
hold (Ctrl + Alt) for more

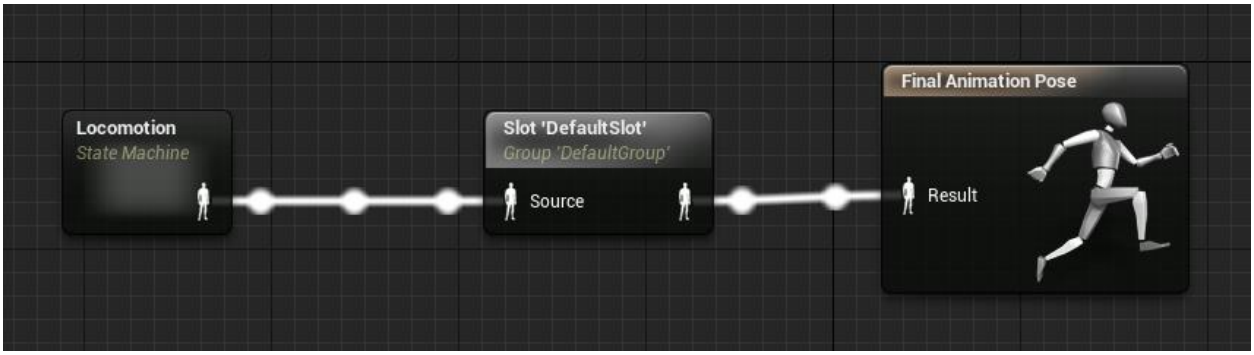

Time 0.0
Value 0.0

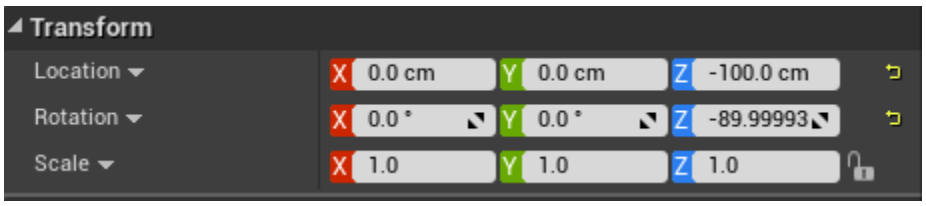


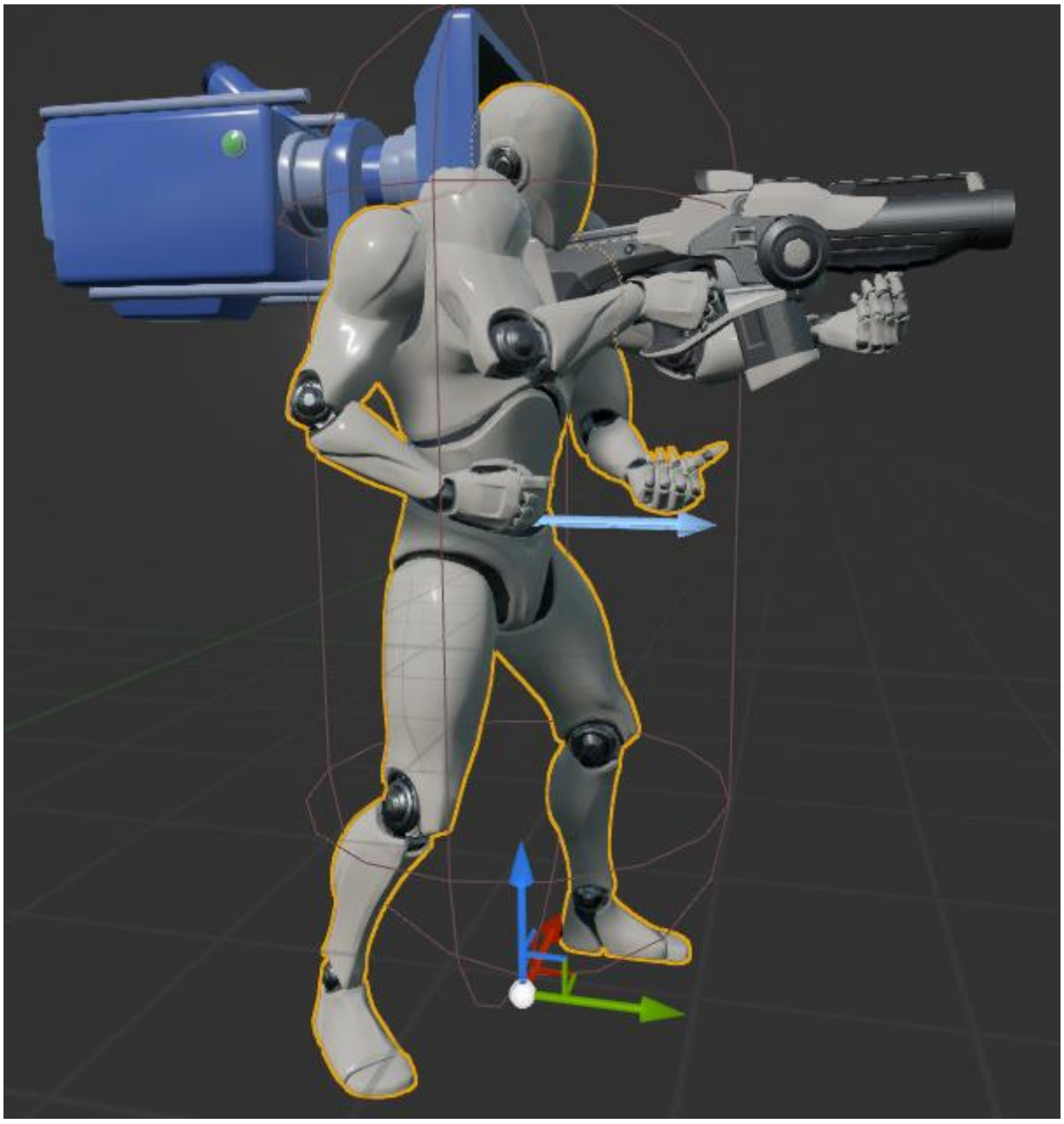

0.00
0.01
0.02
0.02
0.03
0.04
0.05
0.05
0.06
0.07
0.08
0.09
0.09
0.10


BodyColor
Param (0.45,0.406,0.362,0)


Montage
Montage Group: 'DefaultGroup'
Default
Fire_Rifle_Hip
DefaultGroup.DefaultSlot


Locomotion
State Machine
Slot 'DefaultSlot'
Group 'DefaultGroup'
Source
Final Animation Pose
Result


Transform
Location
X 0.0 cm
Y 0.0 cm
Z -100.0 cm
Rotation
X 0.0 °
Y 0.0 °
Z -89.99993
Scale
X 1.0
Y 1.0
Z 1.0

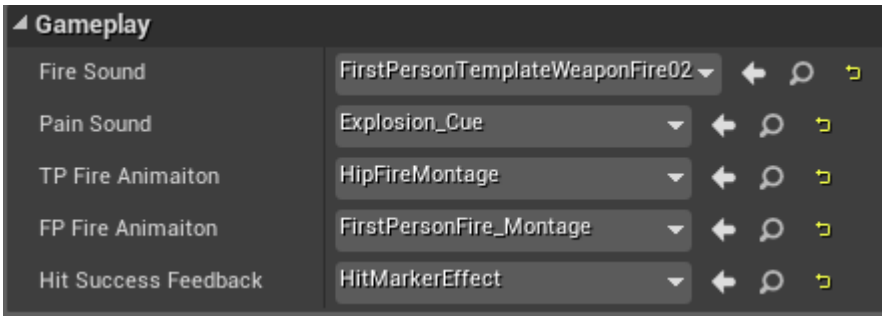


Transform
Location
X 0.0 cm
Y 0.0 cm
Z 0.0 cm
Rotation
X 0.0 °
Y 0.0 °
Z 90.0 °
Scale
X 1.0
Y 1.0
Z 1.0

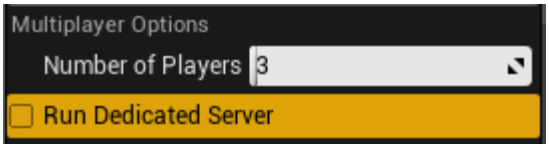
Relative Location
X 0.0
Y 53.0
Z 10.5
Relative Rotation
Roll 0.0
Pitch 0.0
Yaw 0.0
Relative Scale 3D
X 0.05
Y 0.05
Z 0.05

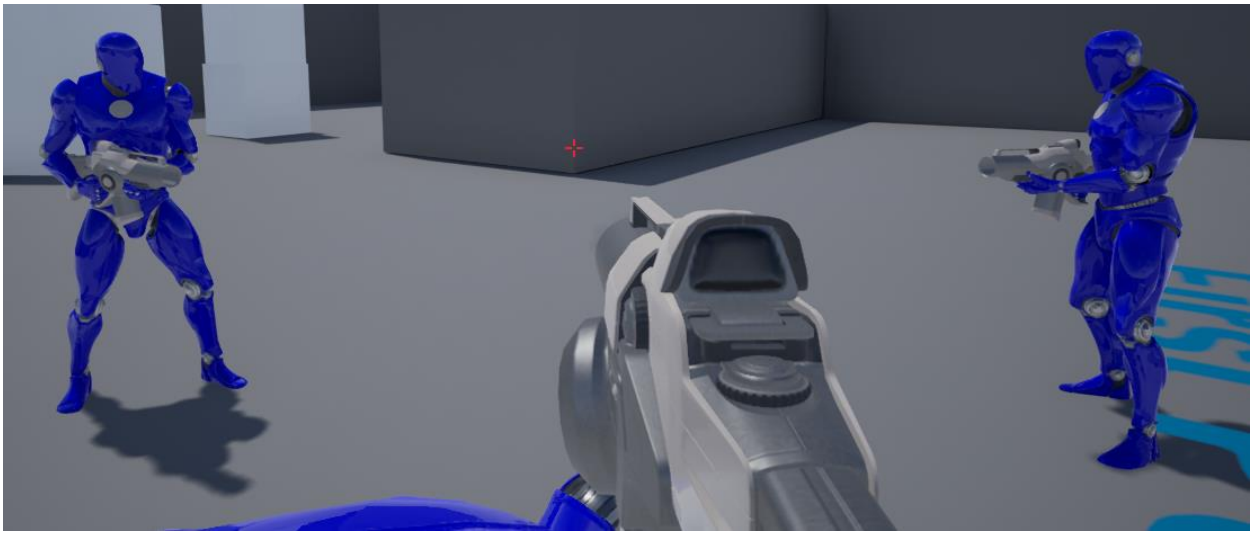
Relative Location
X 0.0
Y 54.0
Z 10.875244
Relative Rotation
Roll 0.0
Pitch 0.0
Yaw 0.0
Relative Scale 3D
X 0.05
Y 0.05
Z 0.05

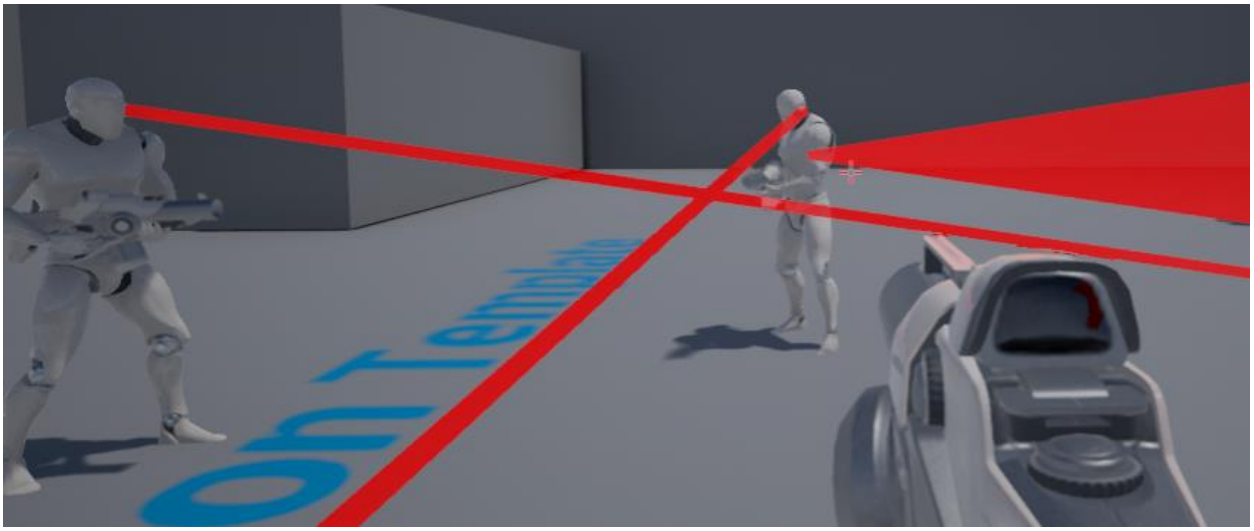
Relative Location
X -110.0
Y 7.0
Z -13.0
Relative Rotation
Roll 0.0
Pitch 0.0
Yaw 0.0
Relative Scale 3D
X 1.0
Y 1.0
Z 1.0


Gameplay
Fire Sound
FirstPersonTemplateWeaponFire02
Pain Sound
Explosion_Cue
TP Fire Animaiton
HipFireMontage
FP Fire Animaiton
FirstPersonFire_Montage
Hit Success Feedback
HitMarkerEffect

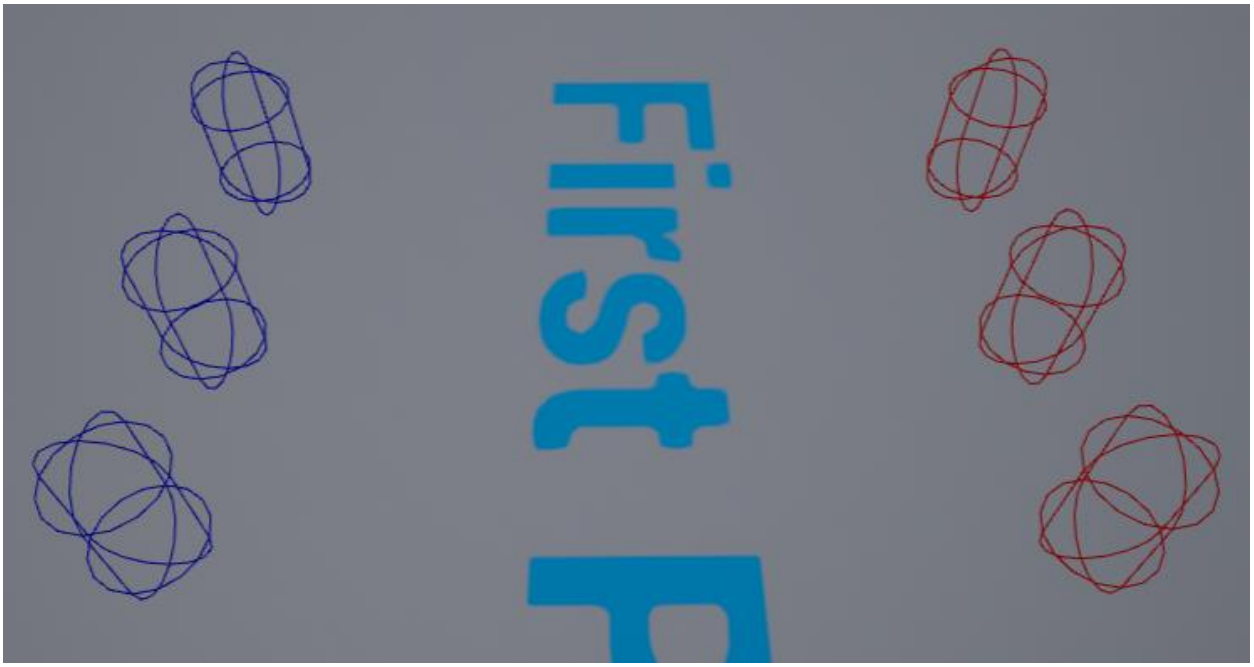
Collision
Simulation Generates Hit Ev
Phys Material Override
None
Generate Overlap Events
Collision Presets
Custom...
Collision Enabled
Collision Enabled (Query and Physics)
Object Type
Character
Ignore
Overlap
Block
Collision Responses
Trace Responses
Visibility
Camera
Object Responses
WorldStatic
WorldDynamic
Pawn
PhysicsBody
Vehicle
Destructible
Character
Can Character Step Up On
ECB No


Multiplayer Options
Number of Players
3
Run Dedicated Server





Cubes	Folder
EditorCube8	StaticMeshActor
EditorCube9	StaticMeshActor
EditorCube10	StaticMeshActor
EditorCube11	StaticMeshActor
EditorCube12	StaticMeshActor
EditorCube13	StaticMeshActor
EditorCube14	StaticMeshActor
EditorCube15	StaticMeshActor
EditorCube16	StaticMeshActor
EditorCube17	StaticMeshActor
EditorCube18	StaticMeshActor
EditorCube19	StaticMeshActor
EditorCube20	StaticMeshActor
EditorCube21	StaticMeshActor

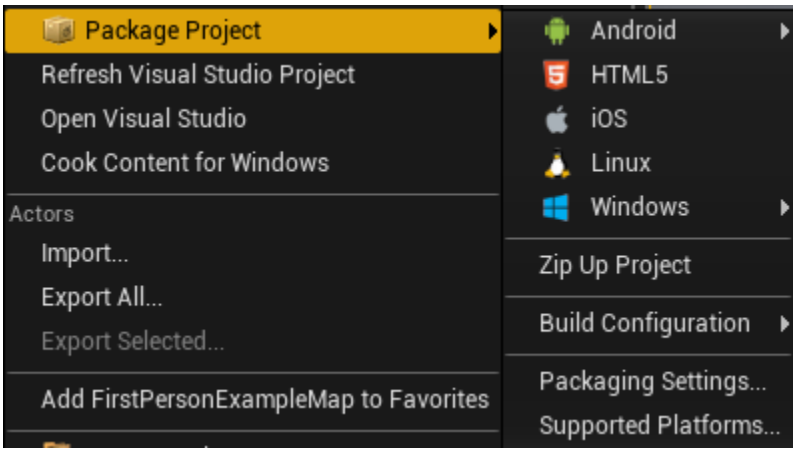

First

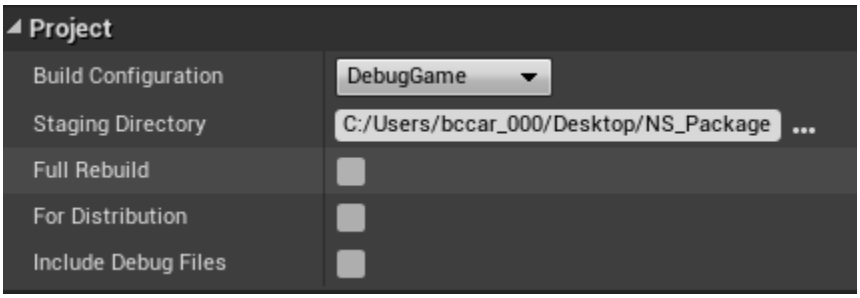
BLUE TEAM:
260
262
Press R to start game
RED TEAM:
261

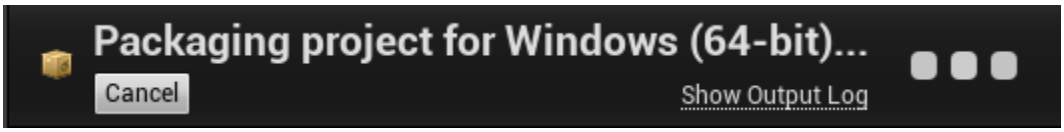
BLUE TEAM:
260
262
Waiting on Server!!
RED TEAM:
261

LIGHTING NEEDS TO BE REBUILT (1 unbuilt object(s))
Health: 100.000000, Score: 2.000000, Deaths: 1

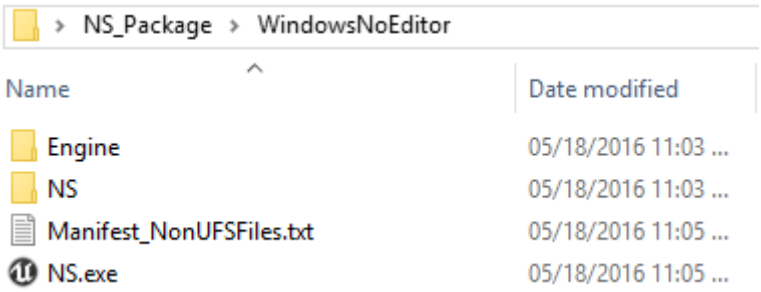
Chapter 10: Goodbyes and Thank yous

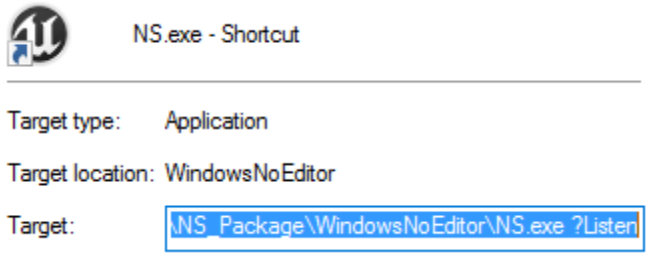




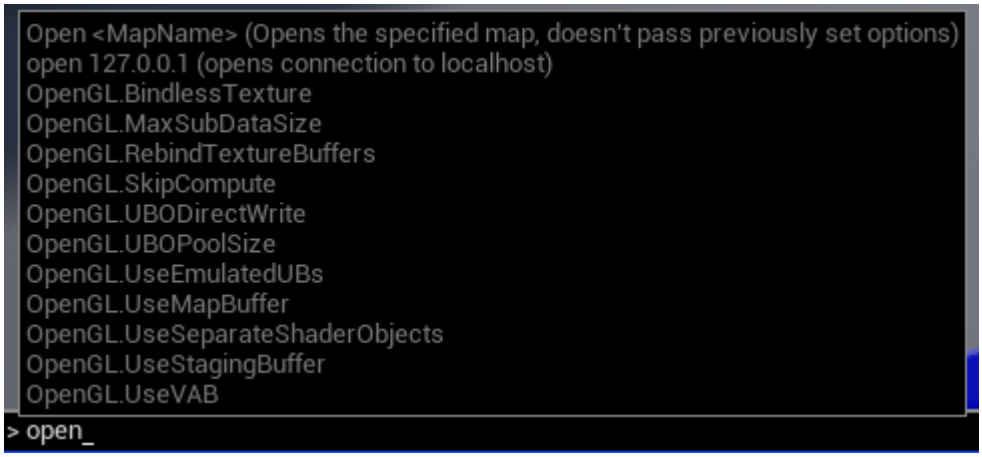



```
MainFrameActions: Packaging (Windows (64-bit)): Project.Archive: ********** ARCHIVE COMMAND COMPLETED **********
MainFrameActions: Packaging (Windows (64-bit)): Automation.Execute: BUILD SUCCESSFUL
MainFrameActions: Packaging (Windows (64-bit)): Automation.Execute: Script execution successful, exiting.
MainFrameActions: Packaging (Windows (64-bit)): ProcessManager.KillAll: Trying to kill 0 spawned processes.
MainFrameActions: Packaging (Windows (64-bit)): Program.Main: AutomationTool exiting with ExitCode=Error_Success
MainFrameActions: Packaging (Windows (64-bit)): Domain_ProcessExit
```


NS_Package
WindowsNoEditor
Name
Date modified
Engine
05/18/2016 11:03 ...
NS
05/18/2016 11:03 ...
Manifest_NonUFSFiles.txt
05/18/2016 11:05 ...
NS.exe
05/18/2016 11:05 ...


NS.exe - Shortcut
Target type: Application
Target location: WindowsNoEditor
Target: \NS_Package\WindowsNoEditor\NS.exe ?Listen

> This is the console_


Open <MapName> (Opens the specified map, doesn't pass previously set options)
open 127.0.0.1 (opens connection to localhost)
OpenGL.BindlessTexture
OpenGL.MaxSubDataSize
OpenGL.RebindTextureBuffers
OpenGL.SkipCompute
OpenGL.UBODirectWrite
OpenGL.UBOPoolSize
OpenGL.UseEmulatedUBs
OpenGL.UseMapBuffer
OpenGL.UseSeparateShaderObjects
OpenGL.UseStagingBuffer
OpenGL.UseVAB
> open_

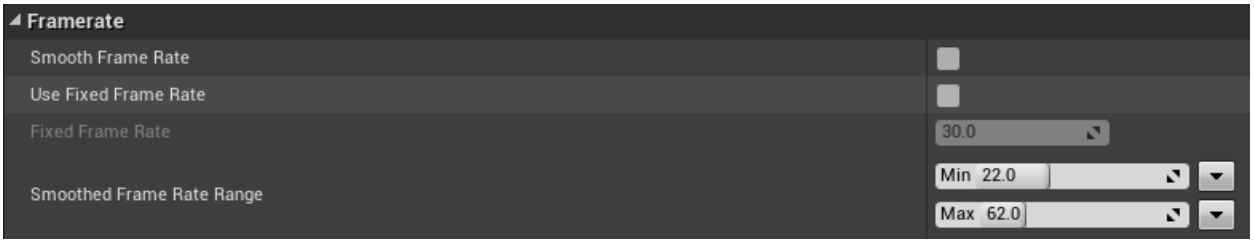
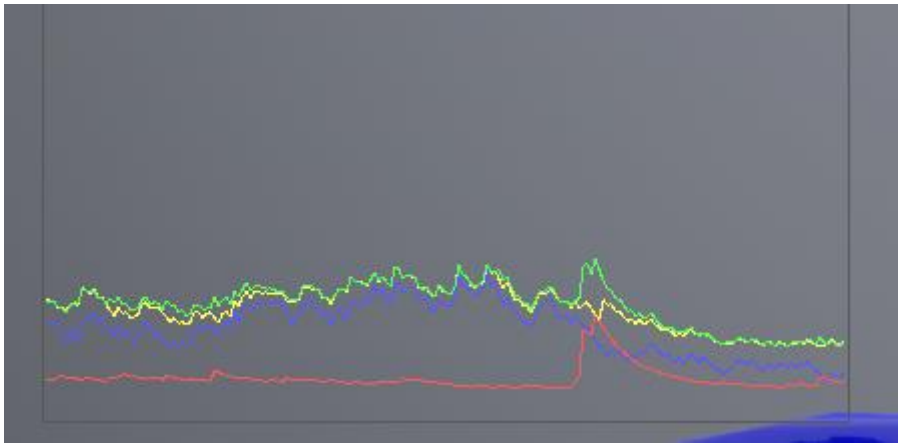
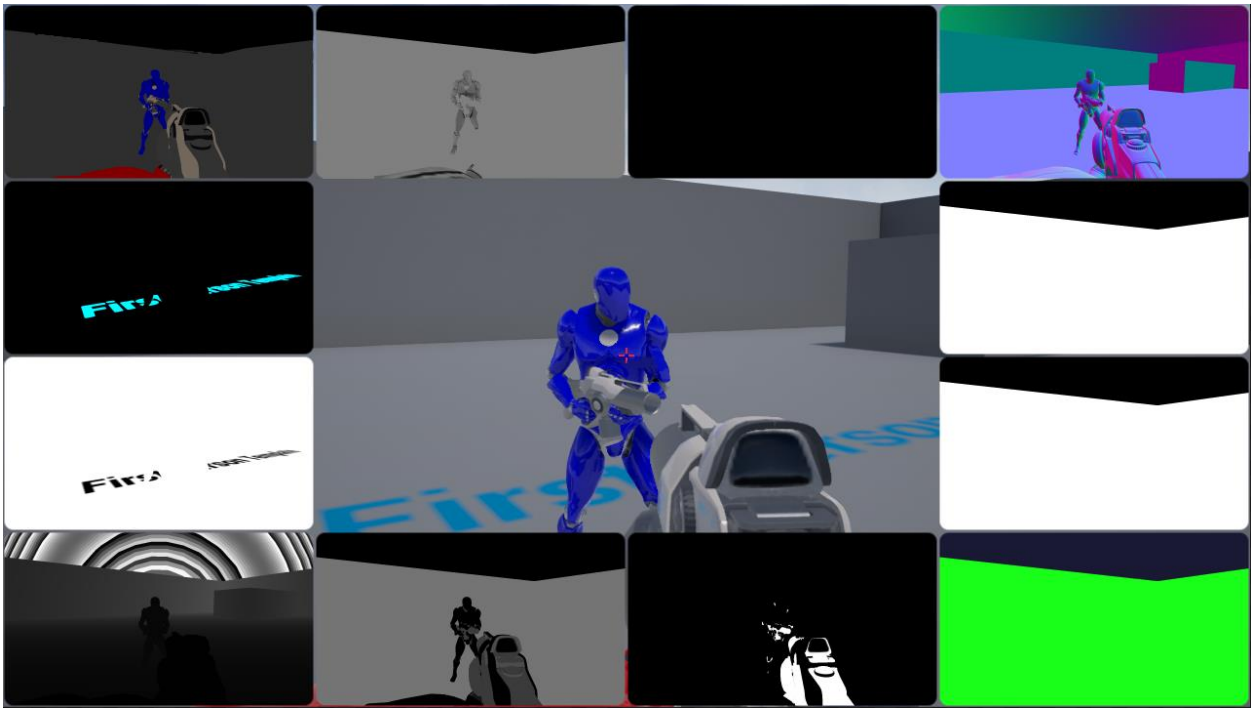
Stat ThreadPoolAsyncTasks
Stat Threads
Stat Tickables
Stat TickGroups
Stat UI
Stat UNIT (Shows hardware unit framerate)
Stat UnitGraph (Draws simple unit time graph)
Stat UObjectHash
Stat UObjects

stat_

61.96 FPS
16.14 ms

62.05 FPS
16.12 ms
Frame: 16.13 ms
Game: 16.09 ms
Draw: 1.60 ms
GPU: 16.13 ms

221.82 FPS
4.51 ms
Frame: 4.55 ms
Game: 2.66 ms
Draw: 2.91 ms
GPU: 4.35 ms


Framerate
Smooth Frame Rate
Use Fixed Frame Rate
Fixed Frame Rate
30.0
Smoothed Frame Rate Range
Min 22.0
Max 62.0