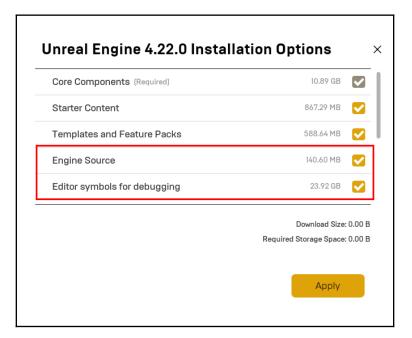
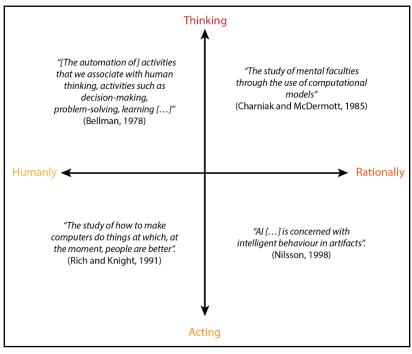
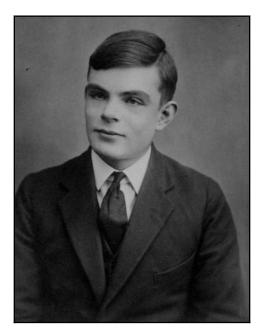
Chapter 1: Making the First Steps in the World of Al







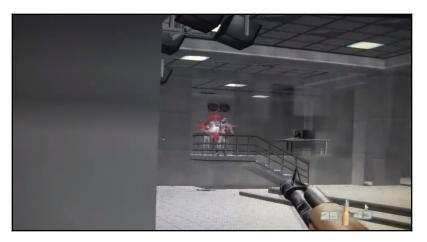




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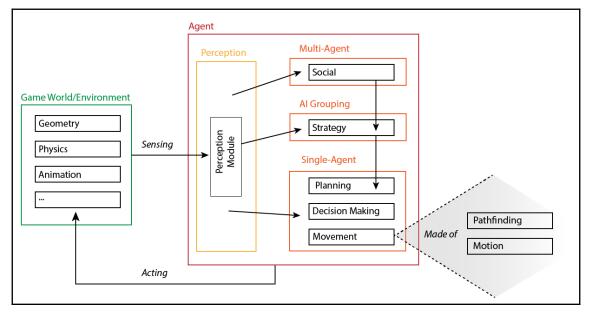


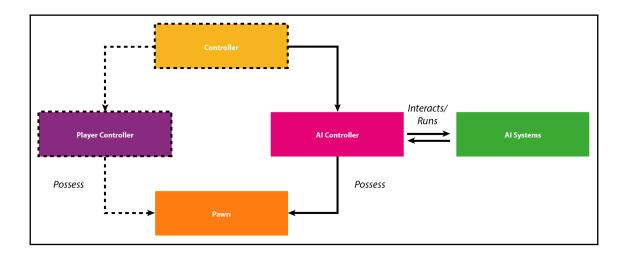




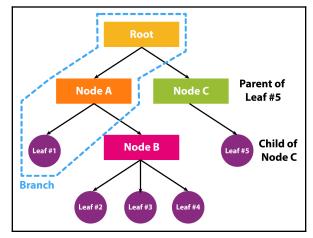


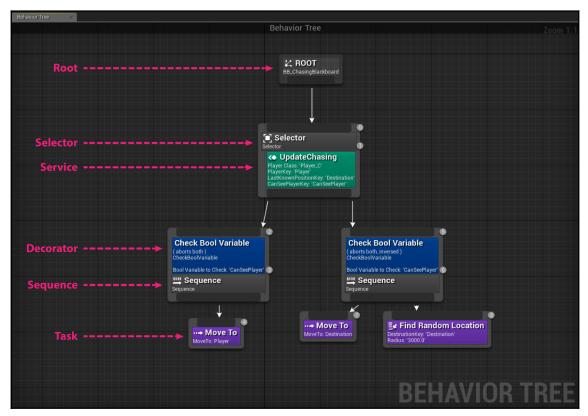


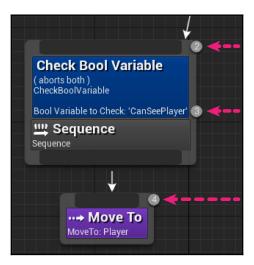




Chapter 2: Behavior Trees and Blackboards



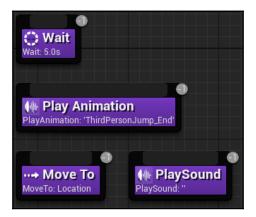


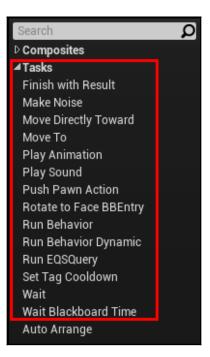






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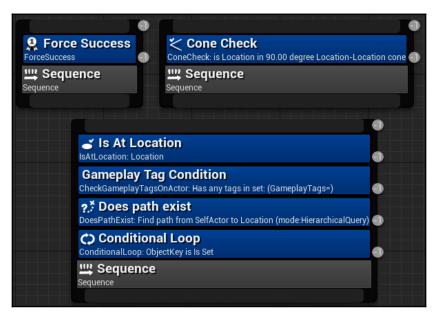




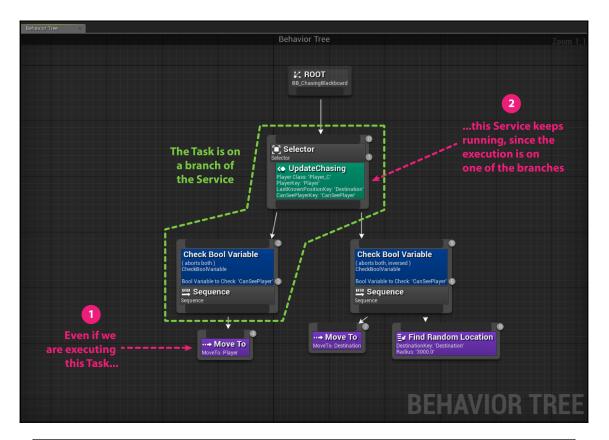






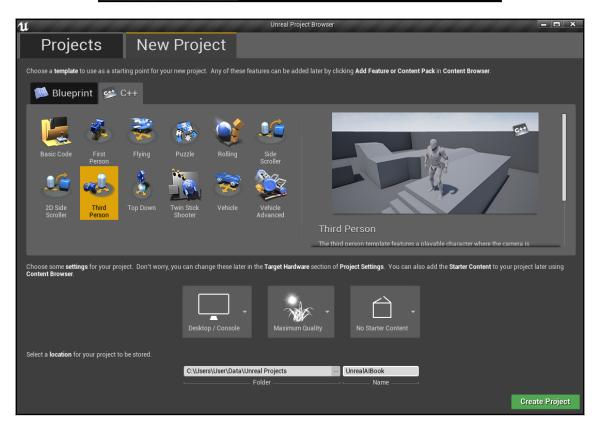


Breakpoints Toggle breakpoi Add breakpoint	nt F9		
Node Actions	Delete Ctrl+X Ctrl+W	Search Blackboard Check Gameplay Tags on Actor Compare BBEntries Composite Conditional Loop Cone Check Cooldown Does Path Exist Force Success Is at Location Is BBEntry Of Class Keep in Cone Loop Set Tag Cooldown Tag Cooldown Time Limit	Q

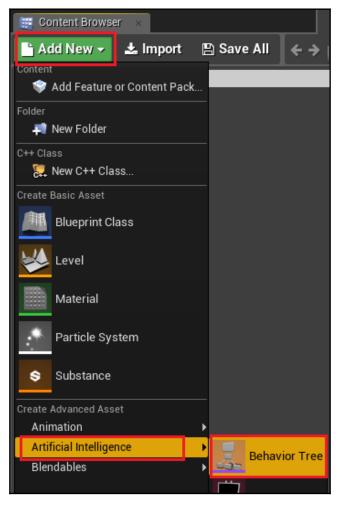




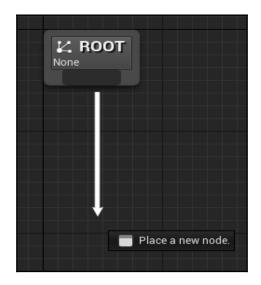
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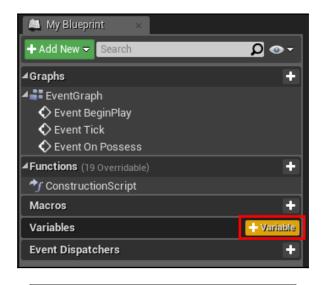




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⊿ Node	
Acceptable Radius	5,0
Filter Class	None 🕶 🔶 🗭 🕂 🗙
Allow Strafe	
Reach Test Includes Agent Radius	
Reach Test Includes Goal Radius	✓
Stop on Overlap	
	₹
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⊿ Task	
Ignore Restart Self	-
Description	
Node Name	Move To

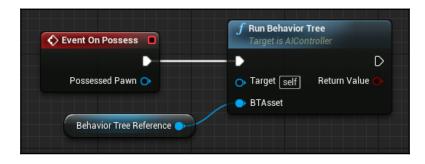
11	Pick Parent Class	×
▲ Common Classes		
Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🖟 Character	A character is a type of Pawn that includes the ability to walk around.	0
📡 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
属 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
la Actor Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components	0
▲ All Classes		
Al Con		X
⊿O Object		
Actor		
Controller AlController		_
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A RigidBodyBase		
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12 items	💿 View Op	otions -
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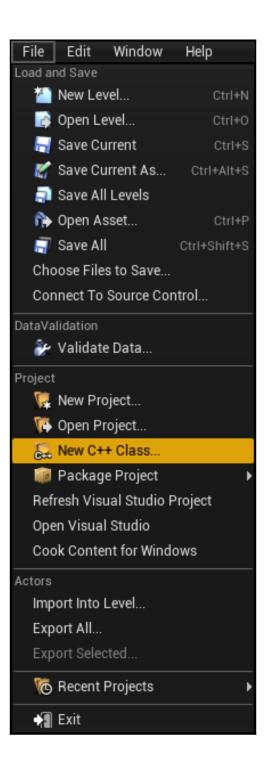


▲Variables + & BehaviorTreeReference -

🧕 Details 🛛 🛛 🕹	
Search Details	◄ ۞ 🏢 🧿
▲ Variable	
Variable Name	BehaviorTreeReference
Variable Type	🎩 Behavior Tree 🔻 🧸
Instance Editable	
Blueprint Read Only	
Tooltip	
Expose on Spawn	
Private	
Category	Default
Replication	None 👻
Replication Condition	None
	₹
▲ Default Value	
Behavior Tree Reference	BT_MyFirstBehaviorTree ▼ ← ₽

🚇 My Blueprint 🛛 🛛		
+ Add New - Search	Ω - ∞ Ω	
⊿ Graphs	+	
EventGraph		
🛇 Event BeginPlay		
🛇 Event Tick		
✓Functions (20 Overridable)	Override 👻 🕂 Function	
🌱 ConstructionScript	Override Function	
Macros	On Using Black Board	
Variables	On Unpossess	
Event Dispatchers	On Possess	
Event Dispatonero	Receive Instigated Any Damage	Event called when PossessedPawn is possessed by this cont
	RadialDamage	Target is AlController
	PointDamage	
	End Play	
	Destroyed	
	AnyDamage	
	ActorOnReleased	
	TouchLeave	
	TouchEnter	
	EndInputTouch	
	BeginInputTouch	
	ActorOnClicked	
	ActorEndCursorOver	
	ActorBeginCursorOver	
	OnReset	
	OnEndViewTarget	
	OnBecomeViewTarget	



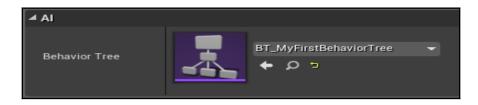


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	separe	nt Class			
his will add a	i C++ header and sou	urce code file to your ga	ame project.		🖌 Show All Classes
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2 AI	IController				
	gationQueryFilter				
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6 items (1 se	elected)				💿 View Options -
	ed Class ed Class Source	AIController 🕜 AIController.h			
			Next>	Create Class	Cancel
			Add C++ Class		×
Name `	Your New	AlControll	er		
nter a name for y	vour new class. Class nam	n <u>es m</u> ay only contain alphan	numeric characters, and may not co	ontain a space.	
			e (.cpp) file will be made using this i		
Name	MyFirstAlController			UnrealAlBook (Ru	untime) – Public Private
Path		real Projects/UnrealAlBook/S	Source/UnrealAlBook/Chapter2/Al		Choose Folder
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				0. h. Eirst A IC ontroller on n	
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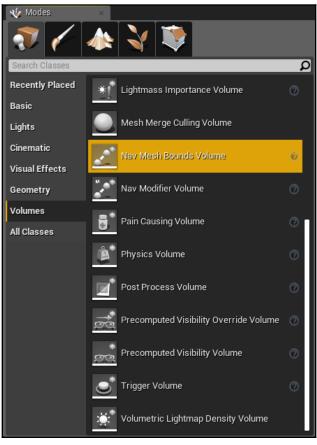
	Compiling new C++ code.	Please wait	86%
UnrealAlBook: Compiling modules	UnrealAlBook: Compiling modules		

🔍 Details 🛛 🛛 🛛	🍥 World Settin	gs ×		
1 ThirdPersonCharacter				ſ.
+ Add Component -			🕫 Edit Bluepr	int≂
Search Components				Q
👔 ThirdPersonCharacter (self)			
 CapsuleComponent (In [†] Mesh (Inherited) Mesh (Inherited) ScameraBoom (Inherited) FollowCamera (Inherited) 	ted)			
°∦CharacterMovement (I	nherited)			L
Search Details			Ω	••
I AI				
Behavior Tree	None No	ne • O	•	

⊿ Pawn	
Use Controller Rotation Pitch	
Use Controller Rotation Yaw	
Use Controller Rotation Roll	
Can Affect Navigation Generation	
Auto Possess Player	Disabled -
Auto Possess Al	Placed in World or Spawned 🕶 🗦
Al Controller Class	MyFirstAlController 🗸 🔶 🔎 🗶 🤤

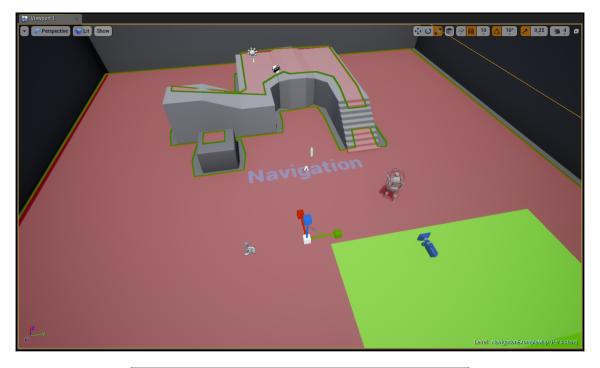


Chapter 3: Navigation

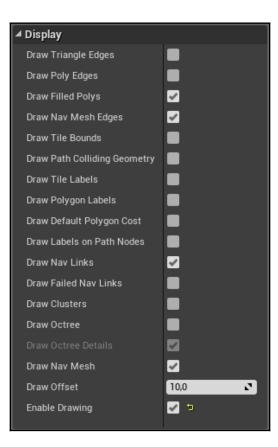








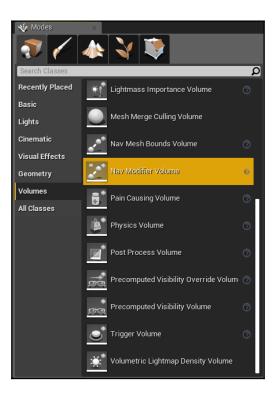
📜 World Outliner 🛛 🛛 😾 Levels	×
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Label	Туре 🚽
 PostProcessVolume SkyLight ArmosphericFog SphereReflectionCapture Multiple_Chamfer DocumentationActor1 NavMeshBoundsVolume NetworkPlayerStart 	PostProcessVolum SkyLight Folder AtmosphericFog SphereReflectionCa StaticMeshActor DocumentationActor NavMeshBoundsVc PlayerStart
RecastNavMesh-Default	RecastNavMesh
SkySphereBlueprint Na TextRenderActor Ha TitrdPersonCharacter	Edit BP_Sky_Sphe TextRenderActor Edit ThirdPersonC
24 actors (1 selected)	💿 View Options 🗸

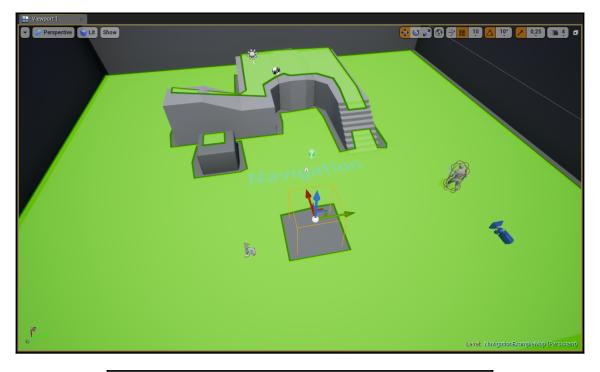


🗓 Details 🛛 🗴 🌏 World Setting	S ×			
RecastNavMesh-Default				.
Search Details			ρ	••
Display				
✓ Generation				
Fixed Tile Pool Size				
Tile Pool Size	1024	2		
Tile Size UU	1000,0	2		
Cell Size	19,0	2		
Cell Height	10,0	2		
Agent Radius	35,0	2		
Agent Height	144,0	2		
Agent Max Height	144,0	2		
Agent Max Slope	44,0	2		
Agent Max Step Height	35,0	2		
Min Region Area	0,0	2		
Merge Region Size	400,0	2		
Max Simplification Error	1,3	2		
Sort Navigation Areas by Cost				
Max Simultaneous Tile Generation Jobs Count	1024	2		
Tile Number Hard Limit	1048576	2		
Poly Ref Tile Bits	20	2		
Poly Ref Nav Poly Bits	32	2		
Poly Ref Salt Bits	12	2		
▷ Nav Mesh Origin Offset	X 0,0	▼ 0,0	♪ Z 0,0	2
Region Partitioning	Watershed	-		
Layer Partitioning	Watershed	•		
Region Chunk Splits	2	~		
Layer Chunk Splits	2	2		
Perform Voxel Filtering	V			
Mark Low Height Areas				
Filter Low Span Sequences				
Filter Low Span from Tile Cache				
Do Fully Async Nav Data Gathering				

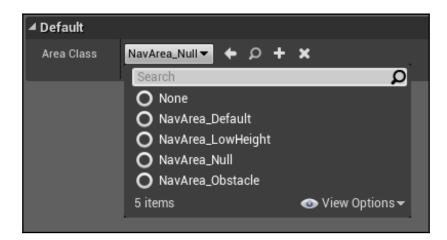
🕊 🙀 Project Settings 🛛 ×			- - ×
	Search Details		0 •
Animation			
Audio	Engine - Navigation System		
Collision		Set as Default Export Impo	rt Reset to Defaults
Console	These settings are saved in DefaultEngine.ini, which is	ourrontly writchio	
Cooker	These settings are saved in DefaultEngine.ini, which is		
Crowd Manager	▲ Navigation		
Gameplay Debugger	Crowd Manager Class	CrowdManager 🗸 🔶 🔎 🗙	
Garbage Collection			
General Settings	▲ Navigation System		
Hierarchical LOD	Auto Create Navigation Data		
Input	Spawn Nav Data in Nav Bounds Level		
Navigation Mesh	Allow Client Side Navigation		
Navigation System	Should Discard Sub Level Nav Data	✓	
Network	Tick While Paused		
Physics	Initial Building Locked		
Rendering	Skip Agent Height Check when Picking Nav Data		
Rendering Overrides (Local)	Data Gathering Mode	Instant 👻	
Slate Settings	Dirty Areas Update Freq	60.0	
Streaming			
Tutorials	▲ Navigation Enforcing		
User Interface	Generate Navigation Only Around Navigation Invokers		
		1.0	
Editor	⊿ Agents		
<u>2D</u>	Supported Agents	0 Array elements 🕂 📆	
Appearance	Supported Agents	o Anay elements	

nimation	Search Details	ρ
udio	Data Gathering Mode	Instant 🗸
collision	Dirty Areas Update Freq	60.0
onsole	▲ Navigation Enforcing	
ooker	Generate Navigation Only Around Navigation Invokers	
rowd Manager	Active Tiles Update Interval	1.0
ameplay Debugger	(tests	
arbage Collection	⊿ Agents	
eneral Settings	▲ Supported Agents	1 Array elements 🛨 💼
lierarchical LOD	⊿ 0	14 members 🔹
nput	Name	Default
lavigation Mesh	D Color	
avigation System	▷ Default Query Extent	X 50.0 Y 50.0 Z 250.0
etwork	Navigation Data Class Name	RecastNavMesh 🔸 🗲 🗶 🗙
hysics	Nav Agent Radius	35.0
endering	Nav Agent Height	144.0
endering Overrides (Local)	Nav Agent Step Height	-1.0
ate Settings	Nav Walking Search Height Scale	0.5
treaming	Preferred Nav Data	
utorials	Can Crouch	-
ser Interface	Can Jump	
litor	Can Walk	-
litoi	Can Swim	

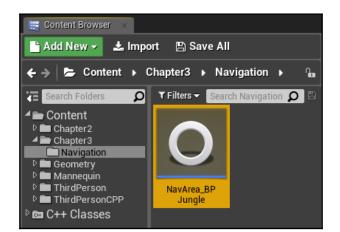




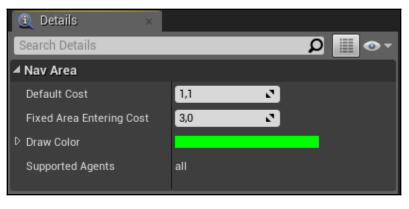
⊿ Default		
Area Class	NavArea_Null▼ ← 오 + ×	
I ⊿ Default		
Area Class	NavArea_Null 🕶 🔶 🔎 🕂	×



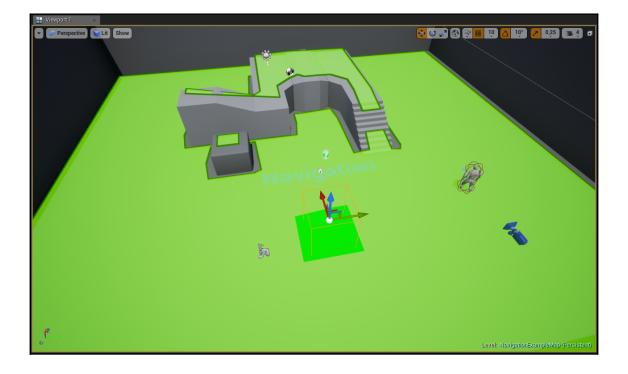
11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🔋 Character	A character is a type of Pawn that includes the ability to walk around.	0
📡 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
📓 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
nter Component	An ActorComponent is a reusable component that can be added to any actor.	0
🔍 Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
NavArea		X
Object		
NavAreaBase NavArea		
O NavArea_Default		
O NavArea_LowHei	ght	
O NavArea_Null		
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AO NavAreaMeta	Northele Devide a const	
O NavAreaMeta_S 9 items (1 selected)	witchByAgent Sview Op	tione
s items (1 selected)		uons •
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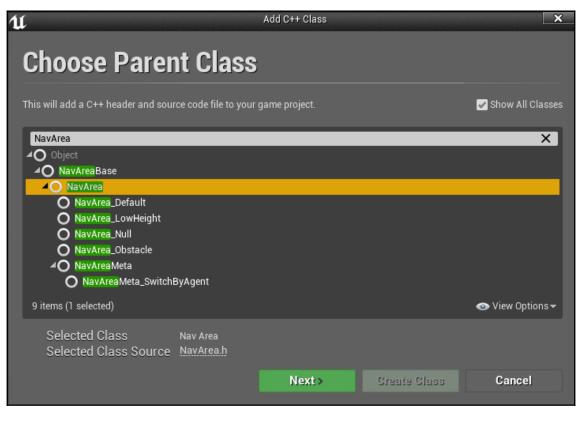






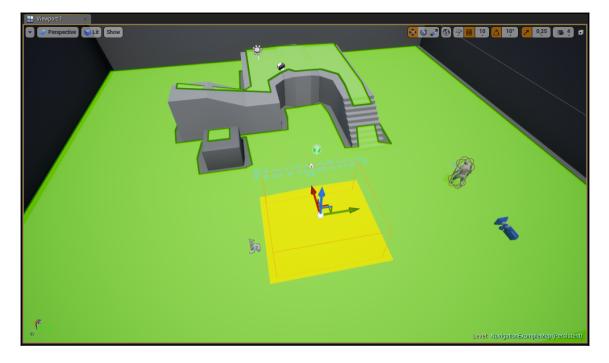




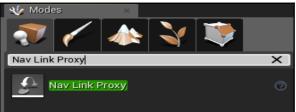


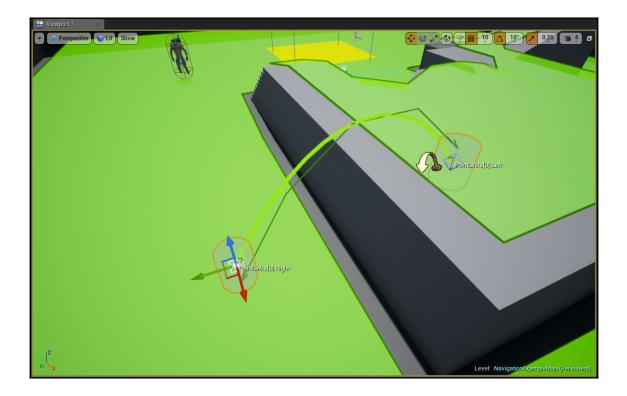
1u		Add C++ Class			×
	Name	Your New Nav Area			
		rour new class. Class names may only contain alphanumeric characters, and may e "Create" button below, a header (.h) file and a source (.cpp) file will be made usit			
	Name	NavArea_Desert	UnrealA	IBook (Runtime) 🕶	Public Private
	Path	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chap	ter3/Navigation/		Choose Folder
	Header File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapt	er3/Navigation/NavArea_Deser	t.h	
	Source File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapt	er3/Navigation/NavArea_Deser	t.cpp	
		< Back	Crea	ite Class	Cancel

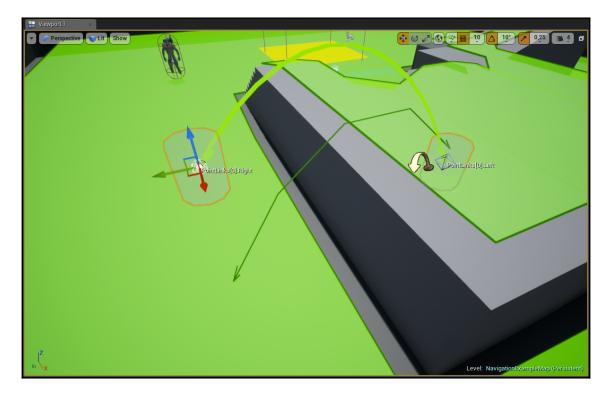




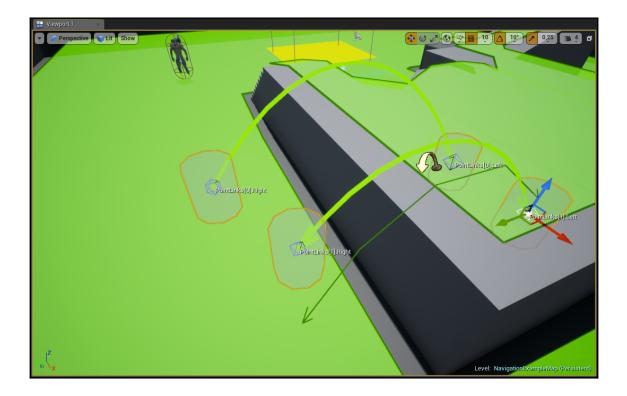




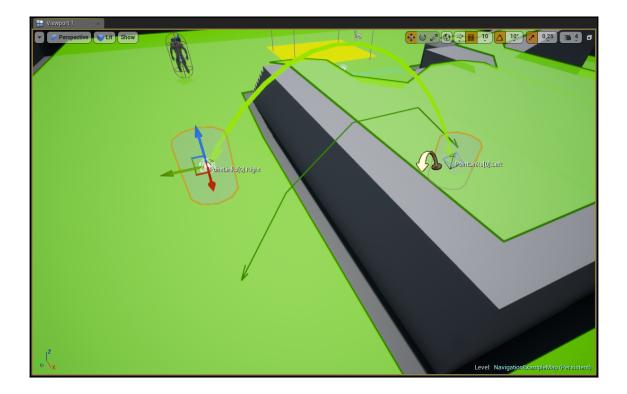


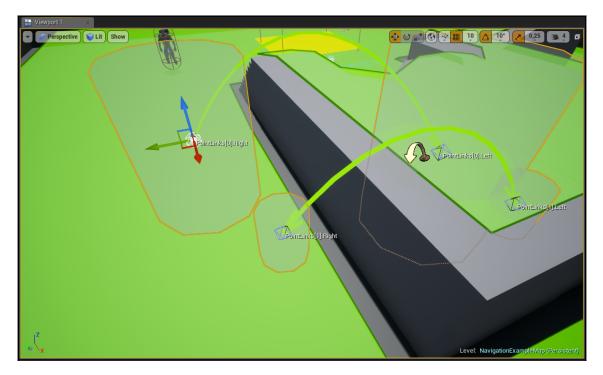


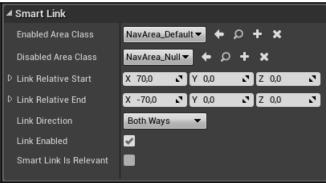
▲ Simple Link					
Point Links	2 Array elements		+	面	t
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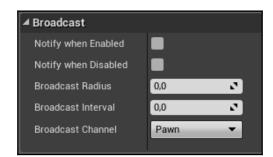


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✓ Point Links	2 Array elements	+ 🗇 🤊	
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Left Project Height	0,0]	
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Direction	Right to Left 🛛 🔫	5	
Snap Radius	30,0]	
Snap Height	50,0]	
Supported Agents	all		
Description]	
Snap to Cheapest Area	N		
Area Class	NavArea_Default 🕶	★ ♀ ★	
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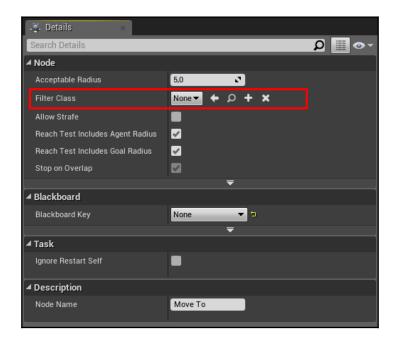




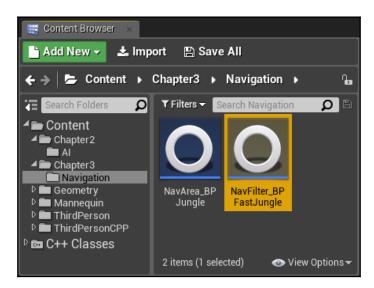


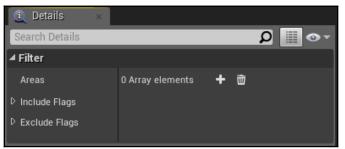
▲ Obstacle		
Create Box Obstacle		
D Obstacle Offset	X 0,0 Y 0,0 Y	Z 0,0 🖍
D Obstacle Extent	X 50,0 Z Y 50,0 Z	Z 50,0 🖍
Obstacle Area Class	NavArea_Null▼ ← ♀ +	×

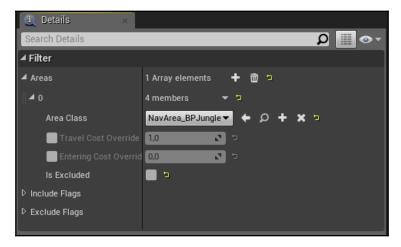




11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Character	A character is a type of Pawn that includes the ability to walk around.	0
📡 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
langle Actor Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
Nav		X
O NavArea_BPJung	ام	_
O NavArea_Default		
O NavArea_Desert		
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- S Rema (P accored)		
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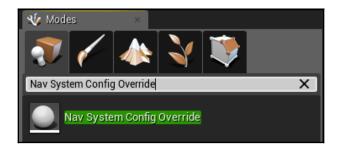






🗓 Details 🛛 🛛 🛛	
Search Details	∽ ₪ ۵
▲ Filter	
◢ Areas	2 Array elements 🕂 💼 🦻
∦ ⊿ 0	4 members 🔻 🗖
Area Class	NavArea_BPJungle 🕶 🌩 🔎 🕂 🗙 🦻
🖌 Travel Cost Override	0,6 🔽 🐄
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Chapter 4: Environment Querying System

11	ThirdPersonExampleMap	
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Appearance Experimental Global Keyboard Shortcuts	General - Experimental Enable and configure experimental Editor features. Set as Default Export Import Reset to Defaults Procedural Foliage
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Miscellaneous Play Play Credentials Viewports Content Editors	✓ User Interface Console for Gamepad Labels Allow ChunkID Assignments
Animation Editor Blueprint Editor Content Browser Curve Editor	Blueprints Blueprint Break on Exceptions Find and Replace All References Tool Cooking
<u>Curve Editor</u> Flipbook Editor <u>Graph Editors</u> Level Sequence Editor	Disable Cook In The Editor feature (cooks from launch on wil Use shared cooked builds in launch on Use multiple processes when cooking (only affects File -> P: 0 3

General

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> Global Keyboard Shortcuts Loading & Saving Miscellaneous Performance Region & Language Source Code Tutorials VR Mode

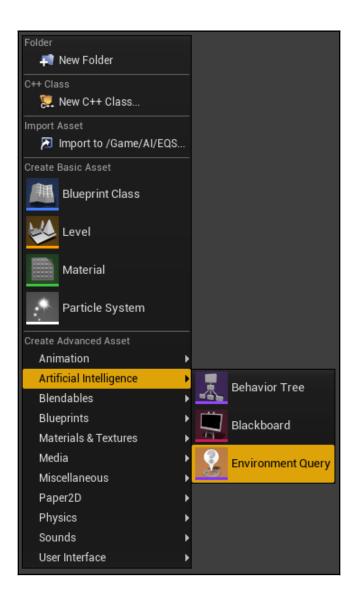
Level Editor

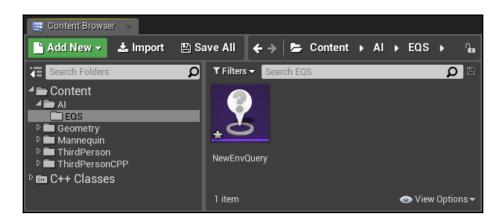
Miscellaneous Play Play Credentials Viewports

Content Editors

Animation Editor Blueprint Editor Content Browser Curve Editor Flipbook Editor Graph Editors Level Sequence Editor

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Allow late joining		
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▲ Lighting Builds		
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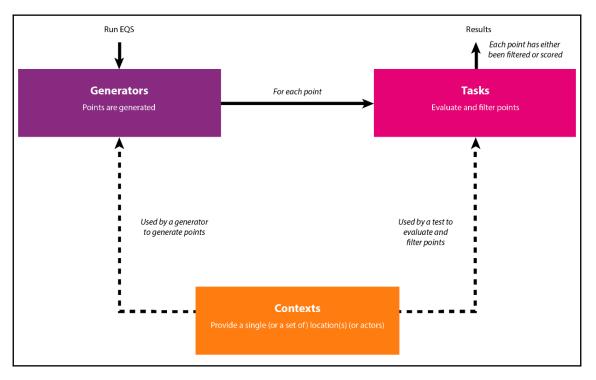


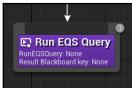


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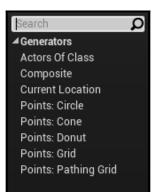
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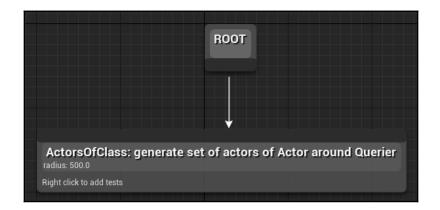
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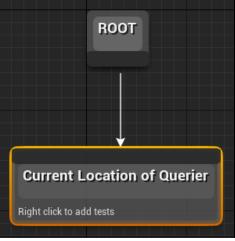
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▲ Blackboard	
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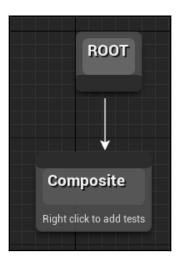
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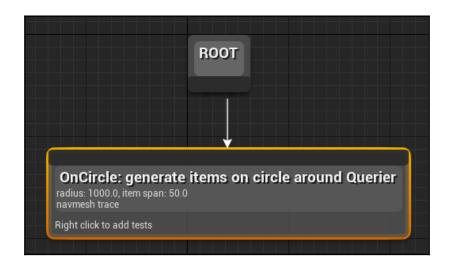


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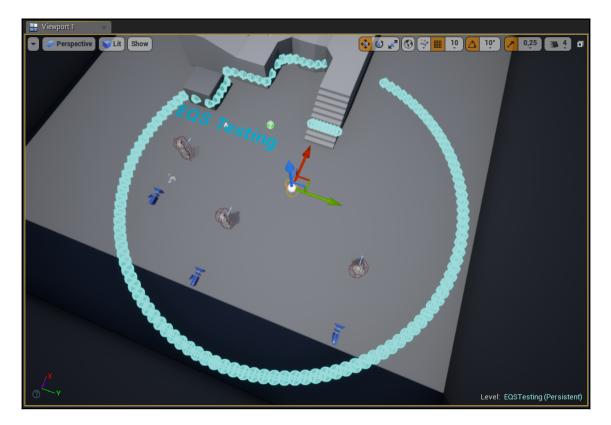


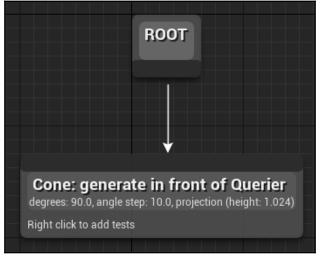
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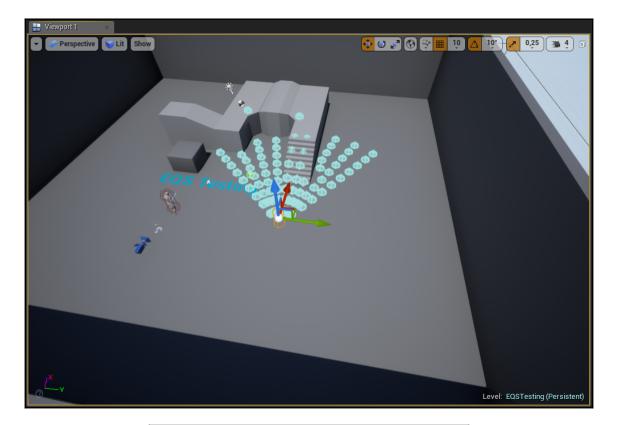
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▷ Circle Radius	1000,0
▷ Space Between	50,0
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Ignore Any Context Actors when Generating Circle	
▷ Circle Center ZOffset	0,0
▷ Trace Data	navmesh trace
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Trace Mode	None
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Option Name	

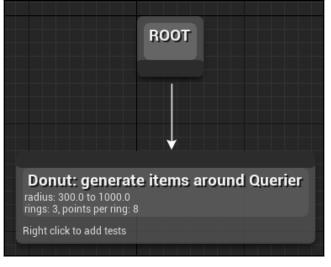




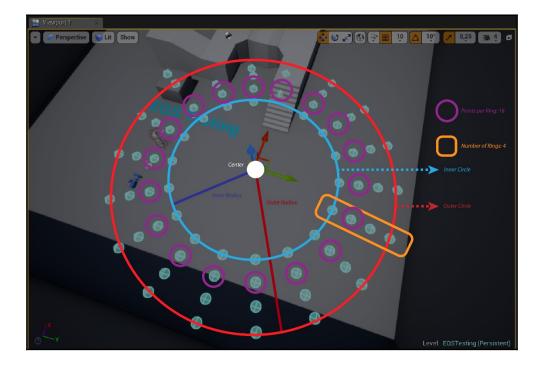


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Include Context Location	
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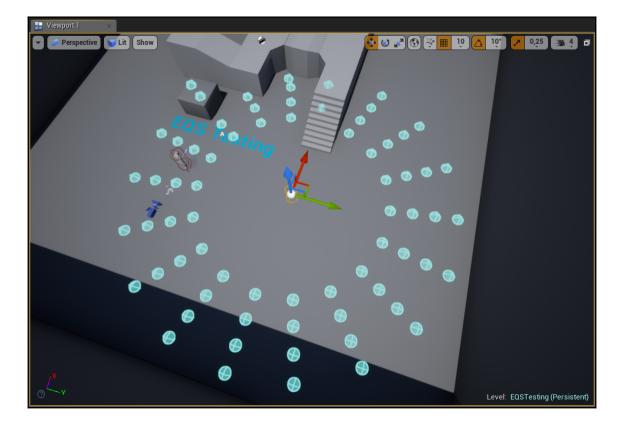


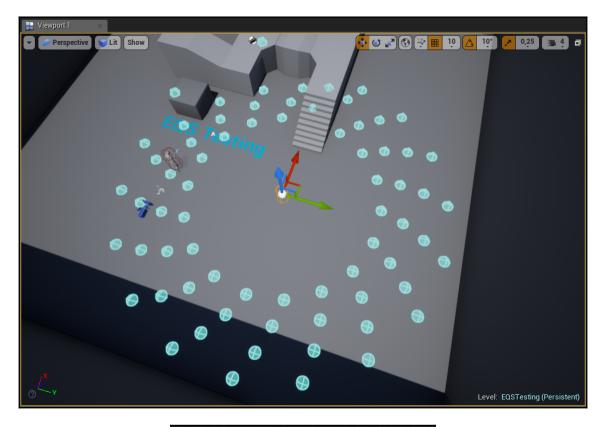


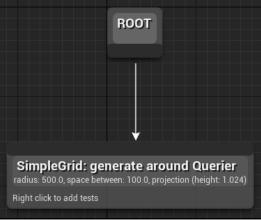
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Arc Direction	
▷ Arc Angle	360,0
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Projection Data	trace disabled
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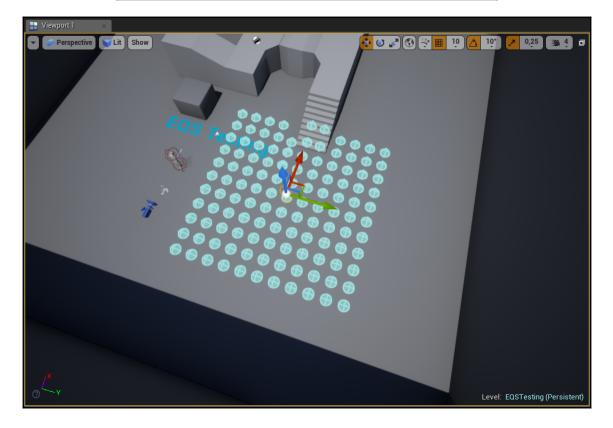
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▷ Outer Radius	1000,0	2	
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▷ Points Per Ring	18		
Arc Direction			
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Projection Data	navmesh trace 🤤		
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Project Down	1024,0		
Project Up	1024,0		
Post Projection Vertical Offset	0,0		
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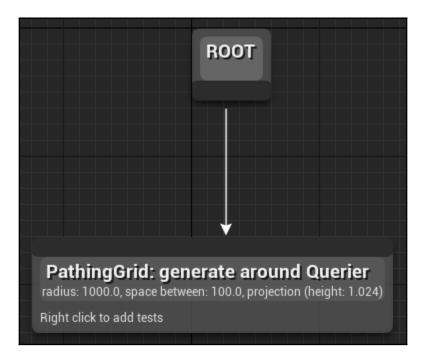




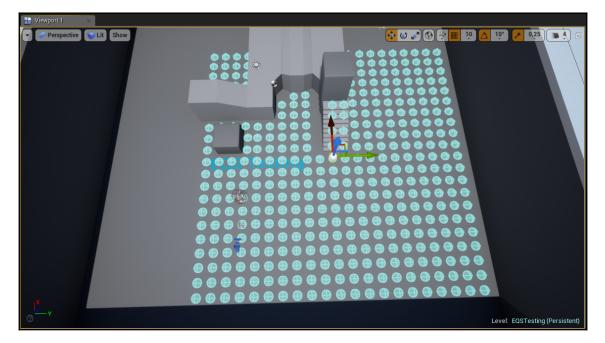


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▷ GridHalfSize	500,0
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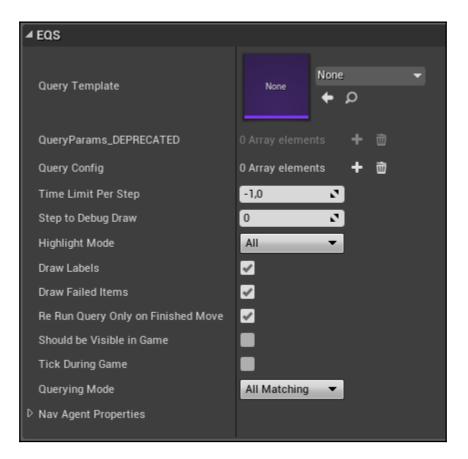


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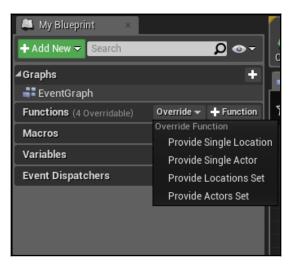


Add Test 🕨	Search
Node Comment	Distance Dot Gameplay Tags Overlap Pathfinding Pathfinding Batch Project Trace

11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🔋 Character	A character is a type of Pawn that includes the ability to walk around.	0
🝹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
nt Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
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11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Character	A character is a type of Pawn that includes the ability to walk around.	0
🝹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
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nter Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
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	your new class. Class names may only contain alphanumeric characters, and may not contain a space e "Create" button below, a header (.h) file and a source (.cpp) file will be made using this name.		
Name	EnvQueryContext_Player	UnrealAlBook (Runtime) -	Public Private
Path	D:/Projects/UnrealAlBook/Source/UnrealAlBook/Chapter4/Al/		Choose Folder
Header File	D:/Projects/UnrealAlBook/Source/UnrealAlBook/Chapter4/Al/EnvQueryContext_Player.h		
Source File	D:/Projects/UnrealAlBook/Source/UnrealAlBook/Chapter4/Al/EnvQueryContext_Player.cpp		
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11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
පී Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Character	A character is a type of Pawn that includes the ability to walk around.	0
🝹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
Sector Component	An ActorComponent is a reusable component that can be added to any actor.	0
🔍 Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
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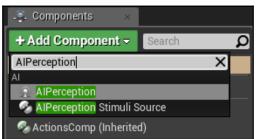
Chapter 5: Agent Awareness

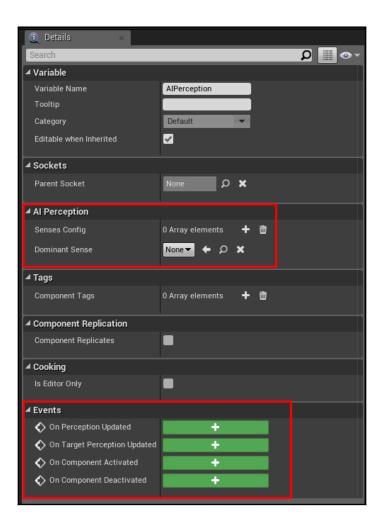






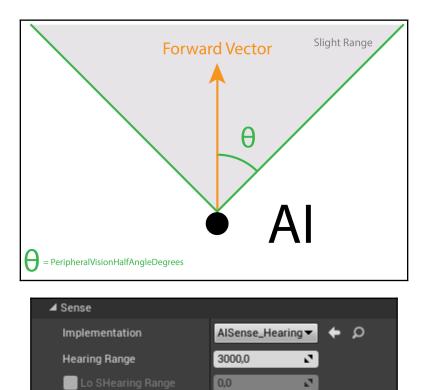






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Lose Sight Radius	3500,0
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Detection by Affiliation

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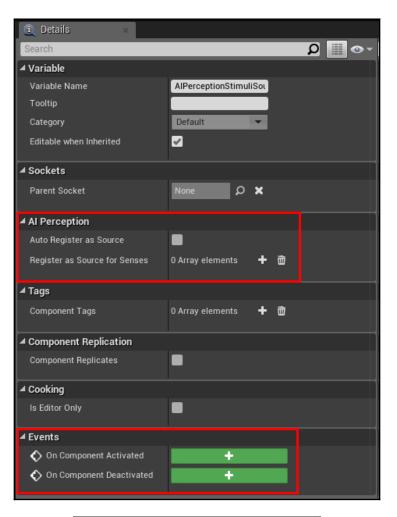
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Detect Neutrals	
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Auto Success Range from Last Seen Location	-1,0
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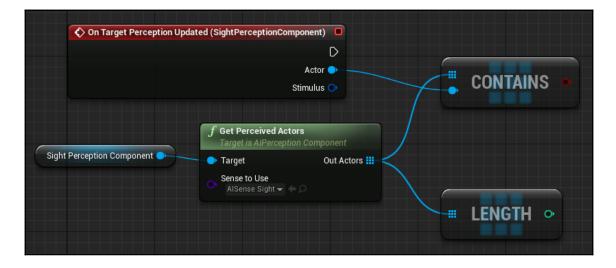
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Detect Enemies	
Detect Neutrals	2 5
Detect Friendlies	V 5
Auto Success Range from La	-1,0
Debug Color	
Max Age	0,0
Starts Enabled	
Dominant Sense	None 🗸 🔶 🔎 🗙

✓ Events	S	
🔷 On	Perception Updated	+
🔷 On	n Target Perception Updated	+
🔷 On	n Component Activated	+
🔷 Or	Component Deactivated	+



eptionComponent) 🔲	
D	
Actor 🔿	
Stimulus 🔿	
🗕 🍑 Target	Out Actors 🔛
Sense to Use AlSense Sight v (=	
	Actor () Stimulus ()

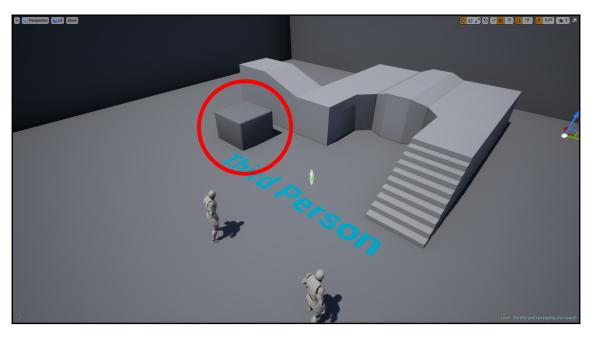


On Target Perception Updated (SightPerceptionComponent) Actor Stimulus	∫ Get Display Name	[] Append	F Print String
Sight Perception Component Sight Perception Component Target Sense to Use Allinence Signt w	e Object Return Value	A Peturn Value B Add pin + C the filed of view. How D C the filed of view. How D D C the filed of view. How D D D D D D D D D D D D D D D D D D D	

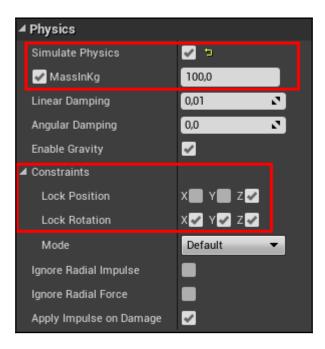


⊿ Pawn	
Use Controller Rotation Pitch	
Use Controller Rotation Yaw	
Use Controller Rotation Roll	
Can Affect Navigation Generation	
Auto Possess Player	Disabled 🗸
Auto Possess Al	Placed in World or Spawned
Al Controller Class	BP_SightAlController - 🔶 🔎 🗙 🦻

4	Pawn	
	Use Controller Rotation Pitch	
	Use Controller Rotation Yaw	
	Use Controller Rotation Roll	
	Can Affect Navigation Generation	
	Auto Possess Player	Disabled 🔻
	Auto Possess Al	Placed in World or Spawned 🔻 🧧
	Al Controller Class	SightAlController 🗸 🔶 🔎 🗙 🦻

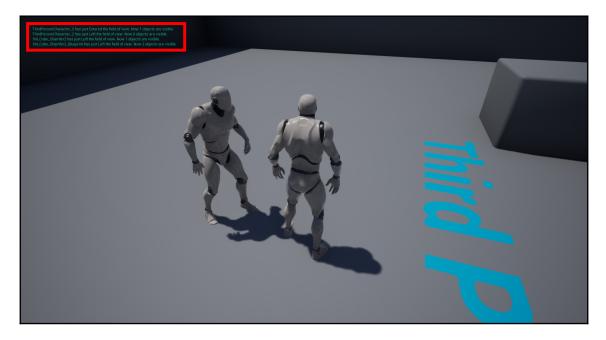


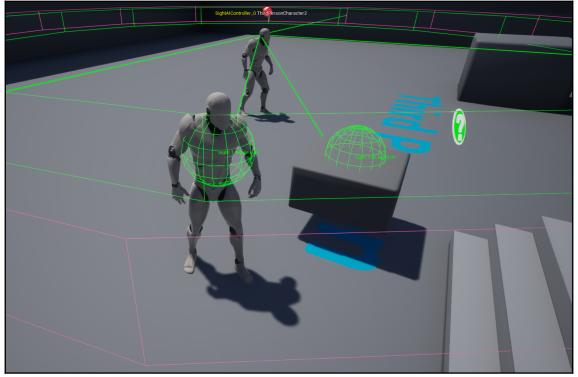
▲ Transform			
Location 🔫	× -500,0	Y 310,0	Z 190,0 5
Rotation -	X 0,0 ° 🖍	Y 0,0 ° 🖍	Z 0,0 ° 🖍
Scale 🔫	X 1,0	Y 1,0	Z 0,5
Mobility	 Static 	Stationary 🔶 M	ovable 🗅



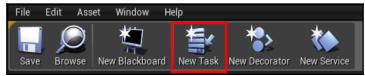


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+ Add Component -		•8 Blueprint/Add Script
Search		Q
 StaticMeshComponent (Inherited) AlPerceptionStimuliSource 		
Search		Ω 📃 👁 -
▲ AI Perception		
Auto Register as Source		
Register as Source for Senses	1 Array elements 🕂 📆 🦻	
0	AlSense_Sight 🕶 💠 🔎 🗙 🔫 🕤	
I Tags		
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▲ Cooking		
ls Editor Only		





Chapter 6: Extending Behavior Trees

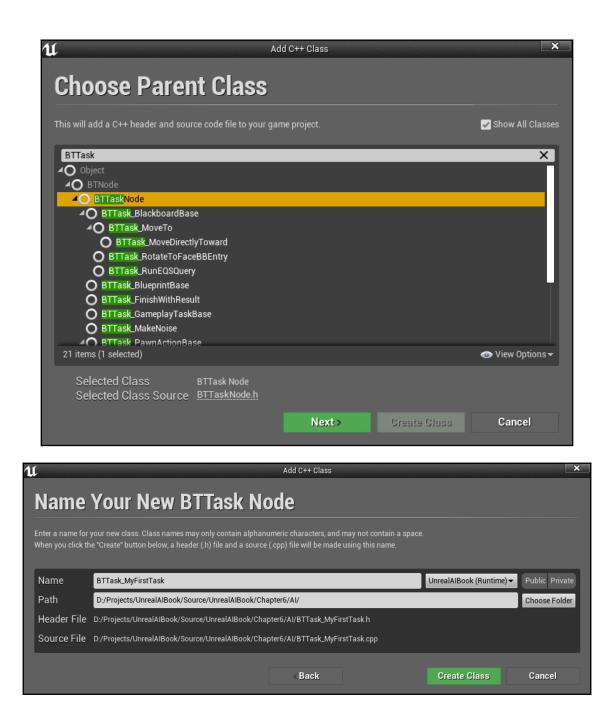


11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Character	A character is a type of Pawn that includes the ability to walk around.	0
💈 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
net a component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
BTTask		X
⊿O Object		
▲O BTNode		
▲O BTTaskNode	*D	
BTTask_Blueprin 4 items (1 selected)	tbase 💿 View Opt	ione –
+ items (1 selected)		0115 -
	Select Canc	el



🔍 My Blueprint 🛛 🛛		
🕂 Add New 👻 Search		₽ ⊙-
⊿ Graphs		÷
EventGraph		
Functions (6 Overridable)	Override 🔫	+ Function
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Event Dispatchers		Execute AI
	Receive	Execute
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	Receive	Abort

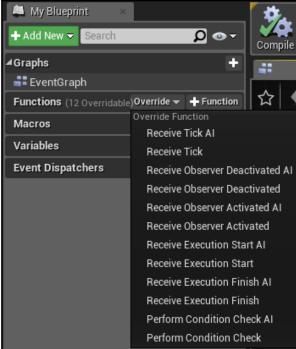




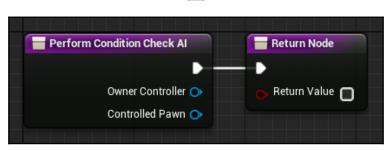
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	,C	2	t		*>	*
Save	Brows	e New	Blackboard	New Task	New Decorator	New Service

11	Pick Parent Class	×
▲ Common Classes		
C Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Character	A character is a type of Pawn that includes the ability to walk around.	0
🝹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
📓 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
actor Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
⊿ All Classes		
BTDecorator		X
⊿O Object		
AO BTNode		
▲O BTAuxiliaryNode ▲O BTDecorator		
BTDecorator_B	lueprintBase	
5 items (1 selected)	👁 View Op	tions -
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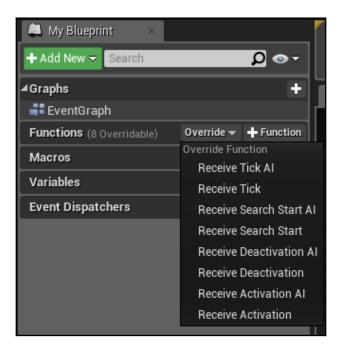
×

۹۲ Al	dd C++ Class		×
Choose Parent Class			
This will add a C++ header and source code file to your gam	e project.		🖌 Show All Classes
BTDecorator			×
O Object O BTNode D BTAuxiliaryNode			
BTDecorator			
BTDecorator_BlackboardBase BTDecorator_Blackboard BTDecorator_ConditionalLoop BTDecorator_IsAtLocation BTDecorator_IsBBEntryOfClass BTDecorator_BlueprintBase BTDecorator_CheckGameplayTagsOnActor BTDecorator_CompareBBEntries BTDecorator_ConeCheck 22 items (1 selected)			e View Options →
Selected Class BTDecorator Selected Class Source BTDecorator h			
	Next >	Create Class	Cancel

U		A	dd C++ Class			×
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		may only contain alphanumeric eader (.h) file and a source (.cpp)				
Name	BTDecorator_MyFirstDecor	ator			JnrealAIBook (Runtime) -	Public Private
Path	D:/Projects/UnrealAIBook/	Source/UnrealAIBook/Chapter6	/AI/			Choose Folder
Header File	D:/Projects/UnrealAIBook/S	Source/UnrealAIBook/Chapter6/	AI/BTDecorator_MyF	irstDecorator.h		
Source File	D:/Projects/UnrealAIBook/	ource/UnrealAIBook/Chapter6/	AI/BTDecorator_MyF	irstDecorator.cpp		
			< Back		Create Class	Cancel
	File Edit As:	set Window H	lelp			
	Save Browse	New Blackboard		New Decorat	or New Service	2

11	Pick Parent Class	×
▲ Common Classes		
Actor	An Actor is an object that can be placed or spawned in the world.	0
🖇 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🖟 Character	A character is a type of Pawn that includes the ability to walk around.	0
📡 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
net a component a	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
BtService		X
▲O Object		
▲O BTNode		
▲O BTAuxiliaryNode ▲O BTService		
BTService_Blue	printBase	
5 items (1 selected)	👁 View Opt	ions -
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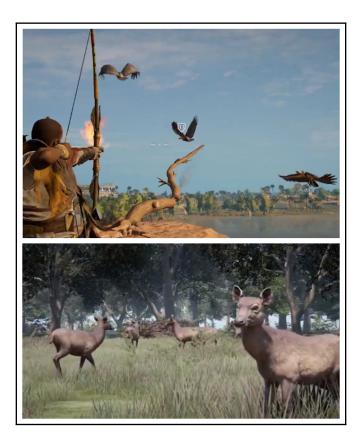
Ú Add	C++ Class		×
Choose Parent Class			
This will add a C++ header and source code file to your ga	me project.		🖌 Show All Classes
BTService			×
▲O Object			
▲O BTNode			
▲O BTAuxiliaryNode			
A BTService			
AO_BTService_BlackboardBase			
O BTService_DefaultFocus			
O BTService_RunEQS			
O BTService_BlueprintBase			
8 items (1 selected)			🐵 View Options 🗸
Selected Class BTService Selected Class Source <u>BTService.h</u>			
	Next>	Create Class	Cancel

u	A	dd C++ Class		×
Name	Your New BTService			
	rour new class. Class names may only contain alphanumeric e "Create" button below, a header (.h) file and a source (.cpp)			
Name	BTService_MyFirstService		UnrealAIBook (Runtime) 🕶	Public Private
Path	D:/Projects/UnrealAIBook/Source/UnrealAIBook/Chapter6	/Al/		Choose Folder
Header File	D:/Projects/UnrealAlBook/Source/UnrealAlBook/Chapter6/	AI/BTService_MyFirstService.h		
Source File	D:/Projects/UnrealAIBook/Source/UnrealAIBook/Chapter6/	AI/BTService_MyFirstService.cpp		
		< Back	Create Class	Cancel

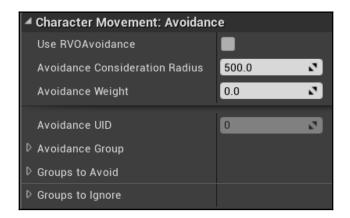
Chapter 7: Crowds

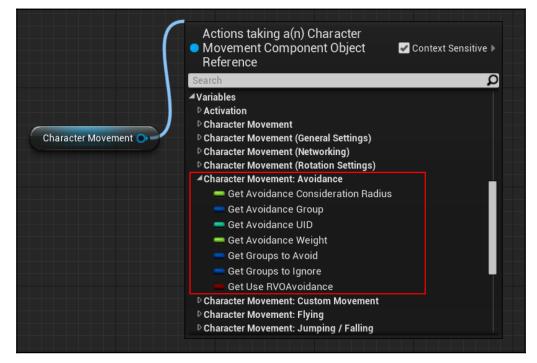


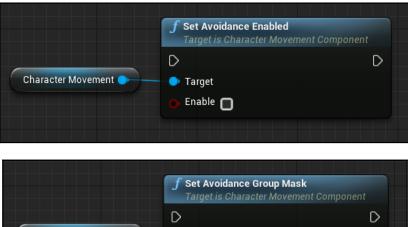


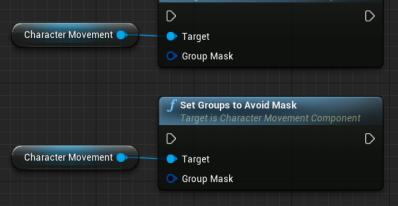


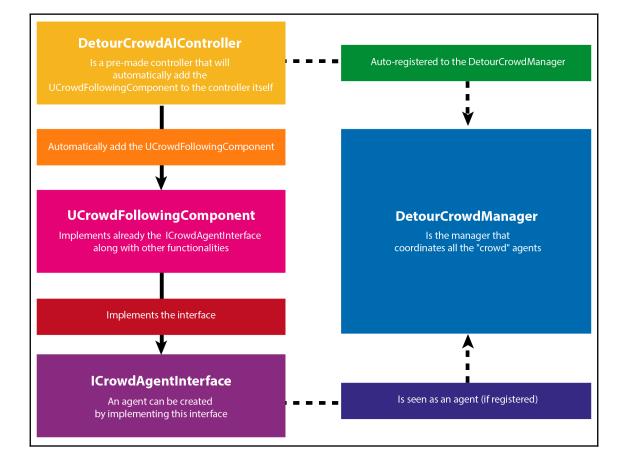




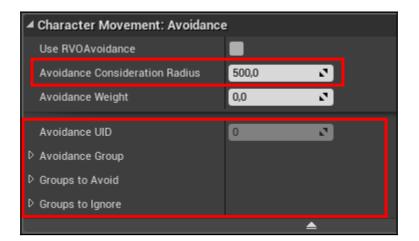


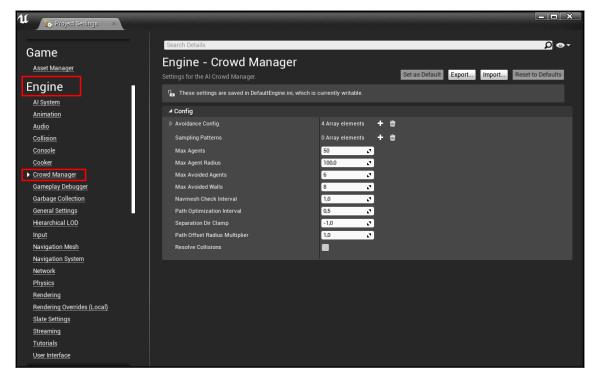




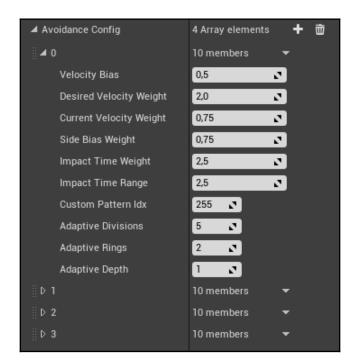


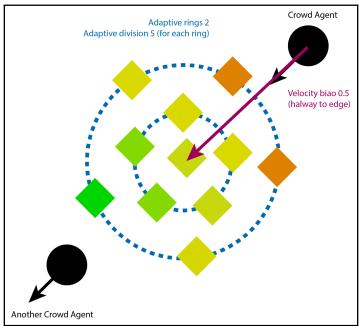
U	Pick Parent Class	×
▲ Common Classes		
Q Actor	An Actor is an object that can be placed or spawned in the world.	0
👌 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🖟 Character	A character is a type of Pawn that includes the ability to walk around.	0
🍹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
langle Actor Component	An ActorComponent is a reusable component that can be added to any actor.	0
C Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
DetourCrowdAIController		X
⊿O Object		
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Controller		
AlController	Controller	
5 items (1 selected)	💿 View Op	tions -
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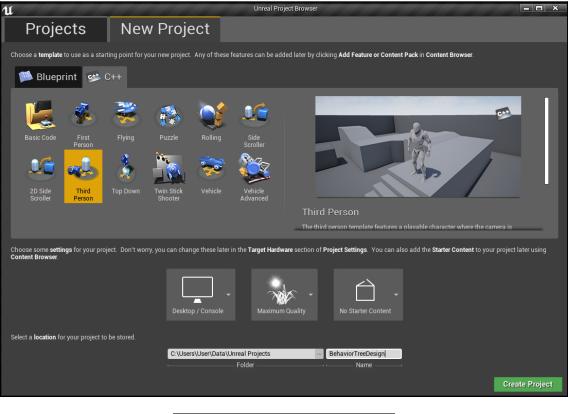


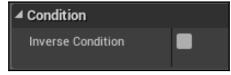
Search Details						∙ ⊚ Ω
Engine - Crowd Manager						
Settings for the AI Crowd Manager.			Set as Default	Export	Import	Reset to Defaults
🔒 These settings are saved in DefaultEngine.ini, which is a	currently writable.					
⊿ Config						
✓ Avoidance Config	4 Array elements 🛛 🕂	ŵ				
	10 members 🛛 🔫					
	10 members 🛛 🔻					
<u>∥</u> ⊳2	10 members 🛛 🔻					
	10 members 🛛 🔻					
Sampling Patterns	0 Array elements 🛛 🕂	ŵ				
Max Agents	50 🔽					
Max Agent Radius	100,0					
Max Avoided Agents	6 2					
Max Avoided Walls	8 2					
Navmesh Check Interval	1,0 🖍					
Path Optimization Interval	0,5 🔹					
Separation Dir Clamp	-1,0 🖍					
Path Offset Radius Multiplier	1,0 🖍					
Resolve Collisions						





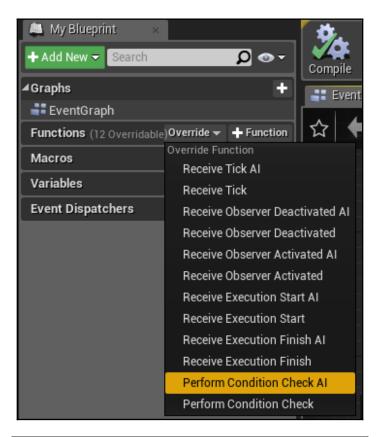
Chapter 8: Designing Behavior Trees - Part I





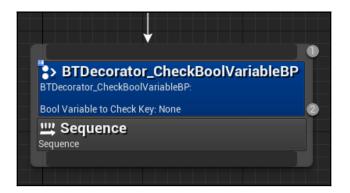
U		TDecorat	or_Chec	(BoolV ×									× -		×
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Comp	a ile -	Save	Brows	e e											
🤯 C	Class Def	aults	×												
		a data onl eprint Edi		nt, so onl	y the defaul	t values are shown.	It does	not have a	ny script or	variables.	If you want	to add son	1e,		
Searc	ch Detail	S											ρ		• •
✓ Flov	w Contro	əl													
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Pul	blic View	,													

🚨 My Blueprint 🛛 🛛	
+ Add New → Search	₽ ∞-
⊿ Graphs	+
EventGraph	
Functions (12 Overridable)	+
Macros	+
⊿ Variables	+
💳 BoolVariableToCheckKey	۲
Event Dispatchers	+





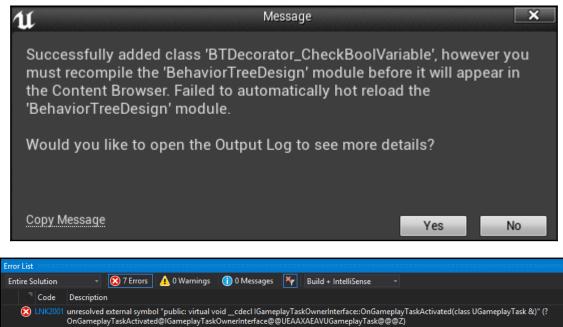




🚑 Details 🛛 🛛 🕹	
Search Details	ړ
▲ Flow Control	
Observer aborts	None
⊿ Default	
Bool Variable to Check Key	None
Description	
Show Property Details	
Node Name	
Condition	
Inverse Condition	

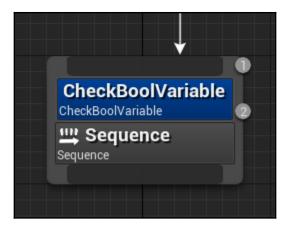
Ú	Add C++ Class		×
Choose Parent Class			
This will add a C++ header and source code file to your ga	ime project.		🖌 Show All Classes
decorator ▲O Object ▲O BTNode ▲O BTAuxiliaryNode			×
BTDecorator BTDecorator_BlackboardBase O BTDecorator_Blackboard BTDecorator_Blackboard O BTDecorator_ConditionalLoop O BTDecorator_IsAtLocation			
BTDecorator_IsBBEntryOfClass BTDecorator_BlueprintBase BTDecorator_CheckGameplayTagsOnActor BTDecorator_CompareBBEntries BTDecorator ConeCheck 26 items (1 selected)			O View Options →
Selected Class BTDecorator Selected Class Source BTDecorator.h			• view options •
	Next>	Create Class	Cancel
	Add C++ Class		×

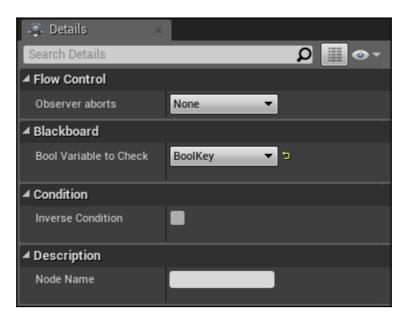
	ew class. Class names may only contain alphanumeric characters, and may not contain a	Name Your New BTDecorator Enter a name for your new class. Class names may only contain alphanumeric characters, and may not contain a space.								
When you click the "Crea	ste [*] button below, a header (h) file and a source (.cpp) file will be made using this name.									
Name BTD	ecorator_CheckBoolVariable	BehaviorTreeDesign (Runtime) -	Public Private							
Path C:/U	sers/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/		Choose Folder							
Header File C:/Us	ers/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/BTDe	ecorator_CheckBoolVariable.h								
Source File C:/Us	ers/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/BTDe	corator_CheckBoolVariable.cpp								

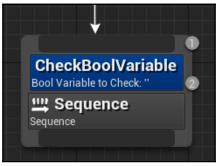


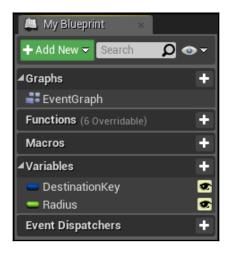
 INK2001 unresolved external symbol "public: virtual void __cdecl lGameplayTaskOwnerInterface::OnGameplayTaskActivated(class UGameplayTask &)" (? OnGameplayTaskActivated@lGameplayTaskOwnerInterface@@UEAAXAEAVUGameplayTask@@@Z)
 INK2001 unresolved external symbol "public: virtual void __cdecl lGameplayTaskOwnerInterface::OnGameplayTaskDeactivated(class UGameplayTask &)" (? OnGameplayTaskDeactivated@lGameplayTaskOwnerInterface@@UEAAXAEAVUGameplayTaskDeactivated(class UGameplayTask &)" (?





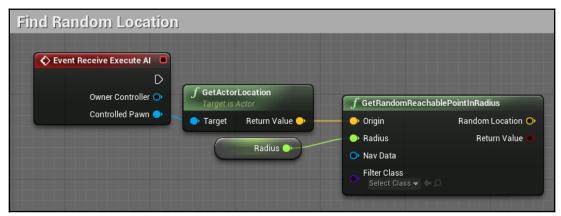






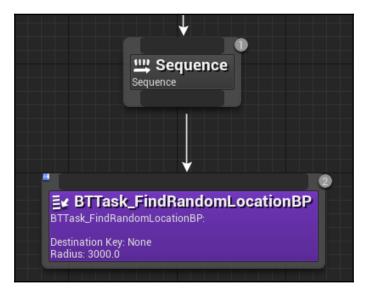
🚇 My Blueprint 🛛 🛛				
🕇 Add New 👻 Search		₽ ⊙ ⊤		
⊿ Graphs		+		
EventGraph				
Functions (6 Overridable)	Override 🔫	+ Function		
Macros	Override Function Receive Tick AI			
⊿ Variables	Receive Tick Receive Execute Al			
DestinationKey				
Radius Event Dispatchers	Receive Execute Receive Abort Al			
	Receive	Abort		





Find Random Location]			
Controlled Payrs	GetActorLocation Target to Actor Target Target Return Value Radius		Destination Key	Set Blackboard Value as Vector

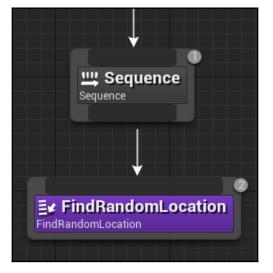
Find Random Location		
Owner Controller O Controller Payn O Controller Payn O Radius Controller Payn O Radius Radius Origin Random Location Radius Return Value Radius Controller Payn O Radius Co	Cestination Key Branch Condition False	Finish Execute Target is BiTask Blueprint Base Target Test Target Test

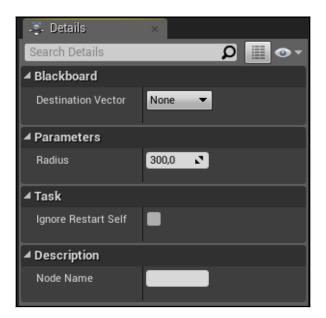


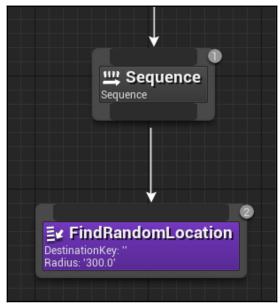
🧔 Details	×	
Search Details		Q 📰 🛛 🕶
⊿ Default		
Destination Key	None 🔻	
Radius	3000,0	
Description		
Show Property Details	2	
Node Name		
⊿ Task		
Ignore Restart Self		

U	Add C++ Class		×
Choose Parent Class			
Choose Parent Glass			
This will add a C++ header and source code file to your game project.			✔ Show All Classes
task			×
O AssetExportTask			
O AssetImportTask			
▲O BlueprintAsyncActionBase			
O AsyncTaskDownloadImage			
∠O BTNode			
BTTaskNode			
AO BTTask_BlackboardBase			
O BTTask_MoveDirectlyToward			
O BTTask_RotateToFaceBBEntry			
O BTTask_RunEQSQuery			
O BTTask_BlueprintBase			
O BTTask_FinishWithResult			
45 items (1 selected)			💿 View Options -
Selected Class BTTask Node Selected Class Source <u>BTTaskNode h</u>			
	Next >	Create Class	Cancel

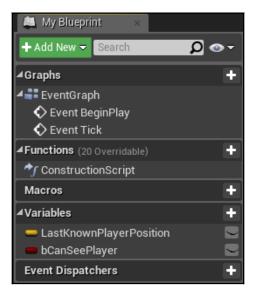
Add C++ Class 11 × Name Your New BTTask Node Enter a name for your new class. Class names may only contain alphanumeric characters, and may not contain a space. When you click the "Create" button below, a header (.h) file and a source (.cpp) file will be made using this name. Name BehaviorTreeDesign (Runtime) -Public Private BTTaskNode_FindRandomLocation Path C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/ Choose Folder Header File C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/BTTaskNode_FindRandomLocation.h Source File C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/BTTaskNode_FindRandomLocation.cpp Back Create Class Cancel







1L	Pick Parent Class	×
▲ Common Classes		
Actor	An Actor is an object that can be placed or spawned in the world.	0
👌 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
🖟 Character	A character is a type of Pawn that includes the ability to walk around.	0
🝹 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
lactor Component	An ActorComponent is a reusable component that can be added to any actor.	0
🕞 Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
AIController		X
⊿O Object		
Actor		
Controller AlController		
	Controller	
GridPathAlCon	troller	
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8 items (1 selected)	💿 View Op	tions v
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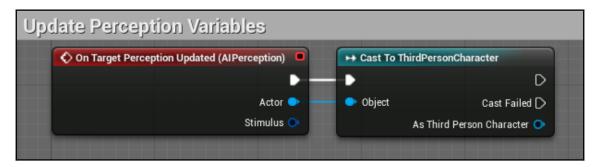


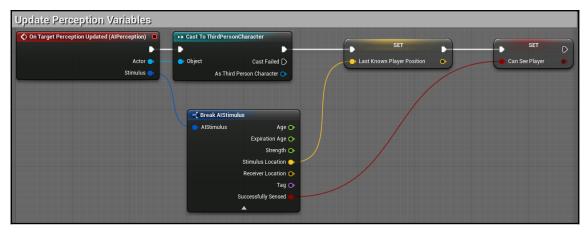


▲ AI Perception				
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ii 0	None 👻 👻 🐄			
Dominant Sense	Search 🔎			
	O None			
⊿ Tags	O Al Damage sense config			
Component Tags O Al Hearing config				
Component rays	O AI Prediction sense config			
Component Replication	🔿 Al Sight config			
O Al Team sense config				
Component Replicates	O AI Touch config			
▲ Cooking	7 items 💿 View Options 🗸 👘			
Is Editor Only				

▲ AI Perception	
▲ Senses Config	1 Array elements 🛛 🛨 🛅 ⊃
⊿ 0	🔵 Al Sight config 🛛 👻 👻
⊿ Sense	
Implementation	AlSense_Sight - 🔶 🔎
Sight Radius	3000,0
Lose Sight Radius	3500,0
PeripheralVisionHalfAngleDegrees	90,0
Detection by Affiliation	
Detect Enemies	
Detect Neutrals	✓ □
Detect Friendlies	🗹 🖻
Auto Success Range from Last Seen Location	-1,0
Debug Color	
Max Age	0,0
Starts Enabled	Z
Dominant Sense	None - P X

✓ Events	
🔷 On Perception Updated	+
🔷 On Target Perception Updated	+
🔷 On Component Activated	+
🔷 On Component Deactivated	+



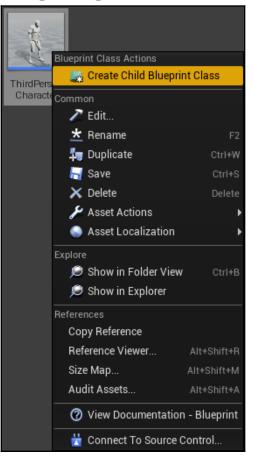


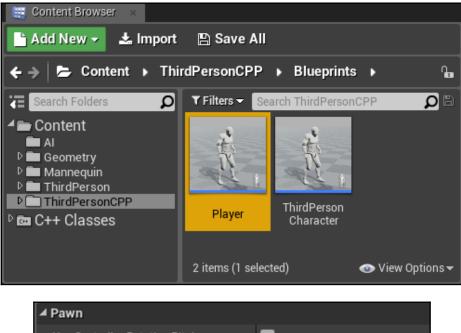
U	Add C++ Class		×
Choose Parent Cla	SS		
This will add a C++ header and source code file to	your game project.		🛃 Show All Classes
AlController Object Actor Controller			×
AlController A NavigationQueryFilter NavFilter_AlControllerDefault			
6 items (1 selected)			💿 View Options -
Selected Class AlController (Selected Class Source AlController.			
	Next>	Create Class	Cancel
น Name Your New AlContr	Add C++ Class		×
Enter a name for your new class. Class names may only contain a When you click the "Create" button below, a header (.h) file and a	alphanumeric characters, and may not cor		
Name ChasingAlController		BehaviorTreeDesign (Ru	ntime) – Public Private
Path C:/Users/User/Data/Unreal Projects/Behavior	rTreeDesign/Source/BehaviorTreeDesign//	AI/	Choose Folder

	Path	C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/AI/			Choose Folder	
	Header File C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/ChasingAlController.h					
Source File C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/AI/ChasingAIController.cpp						
			< Back		Create Class	Cancel

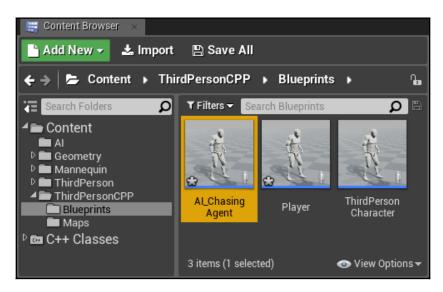
I Pawn	
Use Controller Rotation Pitch	
Use Controller Rotation Yaw	
Use Controller Rotation Roll	
Can Affect Navigation Generation	
Auto Possess Player	Disabled 👻
Auto Possess Al	Placed in World or Spawned 🕶 🗈
Al Controller Class	ChasingAlController - 🔶 🔎 🗶 🦻

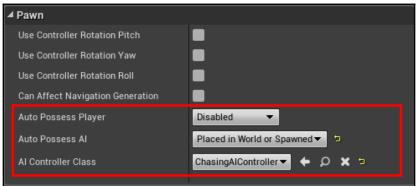
Chapter 9: Designing Behavior Trees - Part II

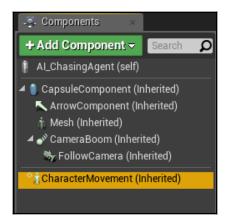




a Pawn	
Use Controller Rotation Pitch	
Use Controller Rotation Yaw	
Use Controller Rotation Roll	
Can Affect Navigation Generation	
Auto Possess Player	Player 0 👻 🗉
Auto Possess Al	Disabled 🗾 🖘
Al Controller Class	AlController - 🗲 🔎 🗙

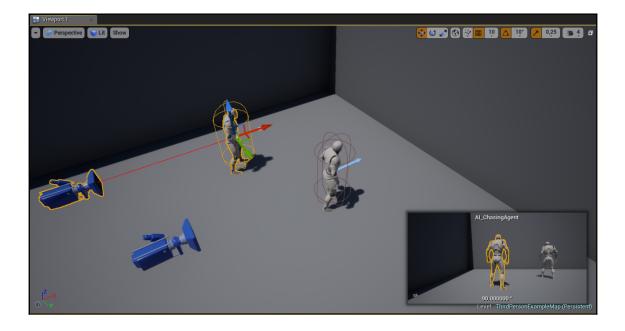


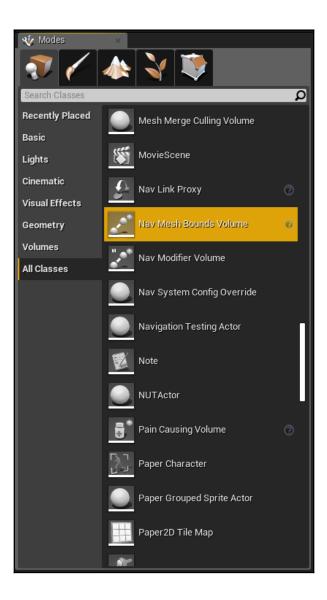




▲ Character Movement: Avoidance		
Use RVOAvoidance	V 5	
Avoidance Consideration Radius	500,0	2
Avoidance Weight	0,0	2
		₹

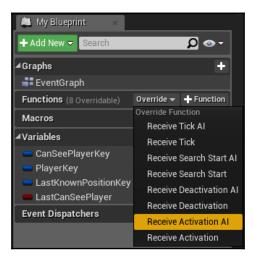


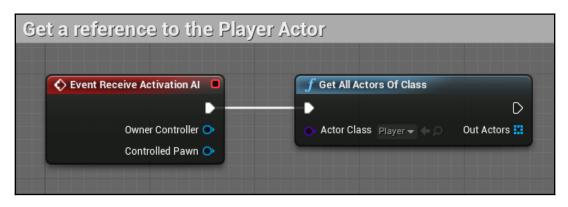






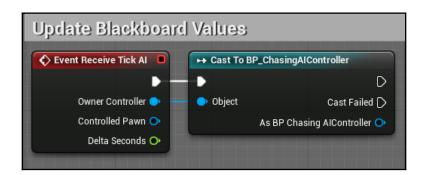




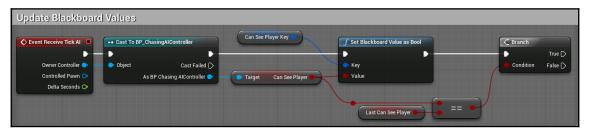


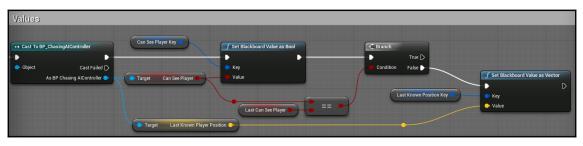


🚨 My Blueprint 🛛 🛛			
+ Add New - Search	_	₽ ⊙-	
⊿ Graphs		+	
🚛 EventGraph			
Event Receive Activation	AI		
Functions (7 Overridable)	Override 🔫	+ Function	
Macros	Override Fur		
	Receive	Tick AI	
⊿ Variables	Receive	Tick	
💳 CanSeePlayerKey	Receive	Search Start /	41
😑 PlayerKey	Receive	Search Start	
😑 LastKnownPositionKey	Receive	Deactivation	۸1
LastCanSeePlayer			~
Event Dispatchers		Deactivation	
	Receive	Activation	

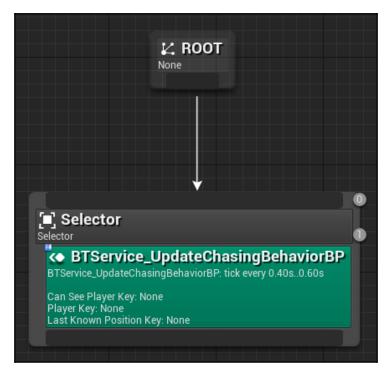








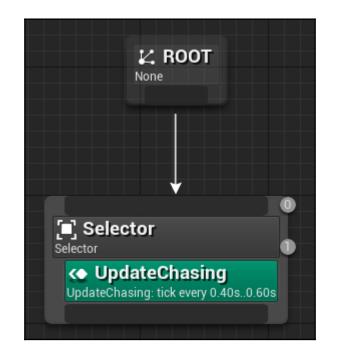
	SET	D
C Branch True Condition False	Can See Player Key Can See Player Key Return Value	•
Last Known Position Key 🕑	Key Value	



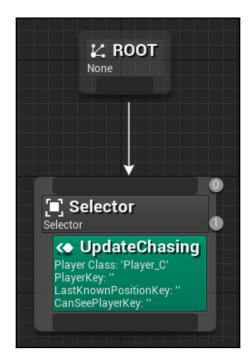
🚑 Details	×	
Search Details		Q 📃 🛛 -
⊿ Default		
Can See Player Key	None 🔻	
Player Key	None 👻	
Last Known Position ł	None 👻	
✓ Description		
Show Property Details	v	
Show Event Details		
Node Name		
▲ Service		
Interval	0,5 🖍	
Random Deviation	0,1	
	—	

1	dd C++ Class		×
Choose Parent Class			
This will add a C++ header and source code file to your ga	me project.		🛃 Show All Classes
BTService			×
∠O Object			
40 BTNode			
4O BTAuxiliaryNode			
BTService			
BTService_BlackboardBase			
BTService_DefaultFocus BTService_RunEQS			
O BTService_BlueprintBase			
8 items (1 selected)			💿 View Options -
Selected Class BTService Selected Class Source <u>BTService h</u>			
	Next>	Create Class	Cancel

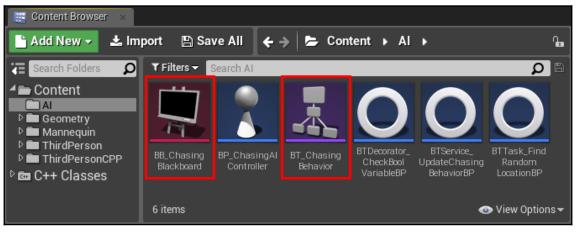
U		Add C++ Class		×	
Name	Name Your New BTService				
Enter a name for your new class. Class names may only contain alphanumeric characters, and may not contain a space. When you click the "Create" button below, a header (.h) file and a source (.cpp) file will be made using this name.					
Name	BTService_UpdateChasing		BehaviorTreeDesign (Runtime) 🗸	Public Private	
Path	C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/ Choose Folder				
Header File	C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/AI/BTService_UpdateChasing.h				
Source File	e C:/Users/User/Data/Unreal Projects/BehaviorTreeDesign/Source/BehaviorTreeDesign/Al/BTService_UpdateChasing.cpp				
		< Back	Create Class	Cancel	

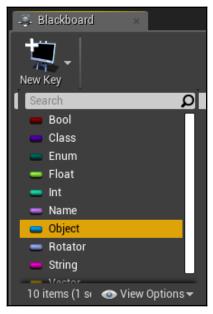


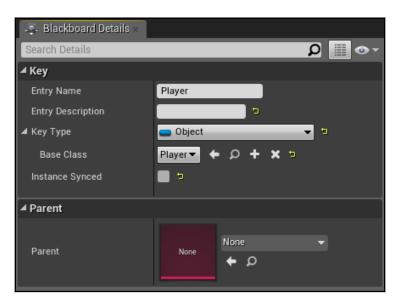
🚑 Details 🛛 🛛 🛛			
Search Details			D 🗐 👁 -
▲ Player Class			
Player Class	Player 🔻 🔶	¢ + x ∍	
▲ Blackboard			
Can See Player Key	None	•	
Player Key	None	•	
Last Known Position Key	None	•	
▲ Service			
Interval	0,5	2	
Random Deviation	0,1	2	
Description			
Node Name			



Chapter 10: Designing Behavior Trees - Part

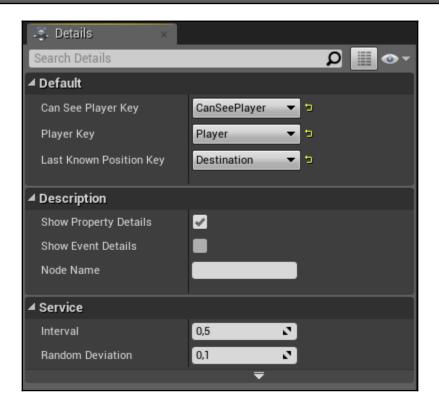




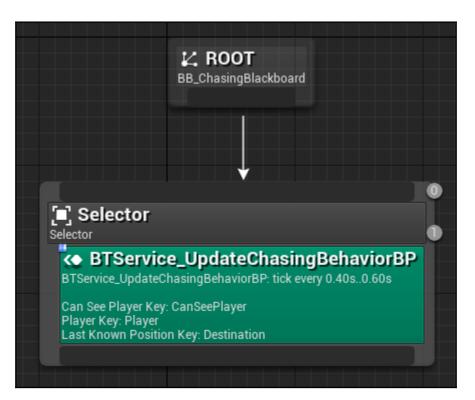


I Blackboard ×	
New Key	
Search	Q
⊿ Keys	
💳 Player	
💳 Destination	
🛑 CanSeePlayer	

🧔 Details	×			
Search Details				- 💿 🏢 Q
⊿ AI				
BehaviorTree				
Blackboard Asset			BB_ChasingBlackboard ♠ Ø ⊐	•

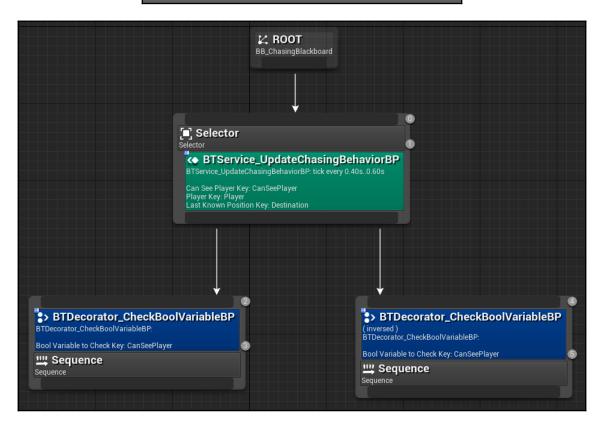


🧔 Details 🛛 🛛 🕹			
Search Details			Q 🔳 💿 -
▲ Player Class			
Player Class	Player 🕶 🔶	ວ +× ∍	
▲ Blackboard			
Can See Player Key	CanSeePlayer	• •	
Player Key	Player	• •	
Last Known Position Key	Destination	• 5	
▲ Service			
Interval	0,5	2	
Random Deviation	0,1	2	
	₹		
Description			
Node Name			

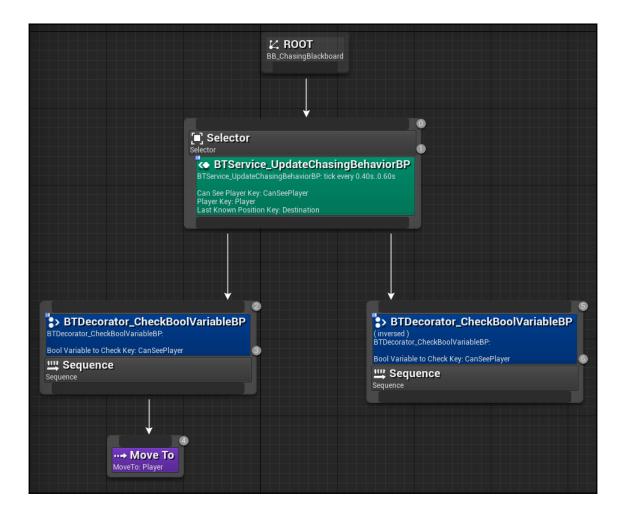


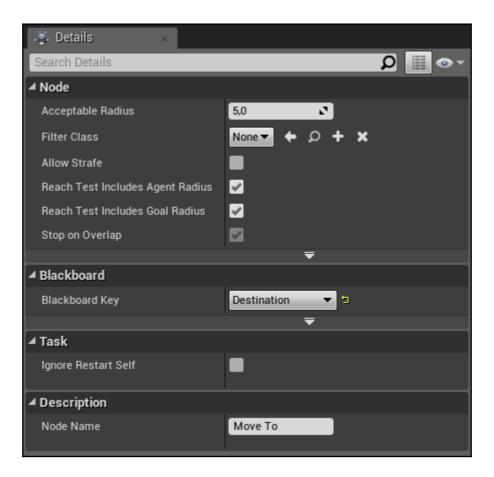
🍜 Details 🛛 🛛 🕹	
Search Details	يە 📰 🖉
▲ Flow Control	
Observer aborts	None
⊿ Default	
Bool Variable to Check Key	CanSeePlayer 🔻 🖻
✓ Description	
Show Property Details	✓
Node Name	
Condition	
Inverse Condition	

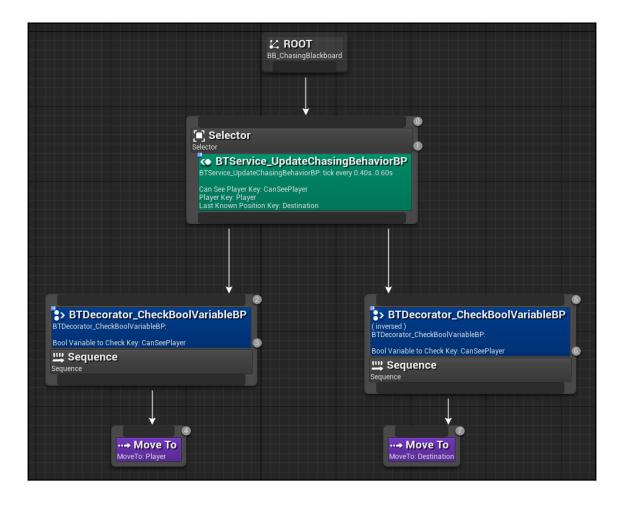
💐 Details 🛛 🛛 🕹	
Search Details	Q 🗐 💿 -
▲ Flow Control	
Observer aborts	None
⊿ Default	
Bool Variable to Check Key	CanSeePlayer 🔻 ⊃
Description	
Show Property Details	✓
Node Name	
Condition	
Inverse Condition	✓ ₽

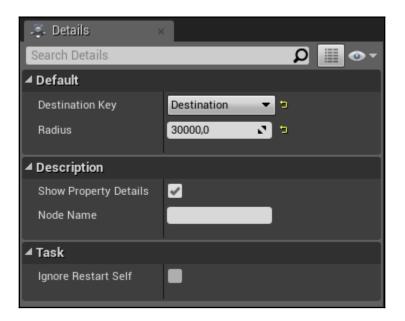


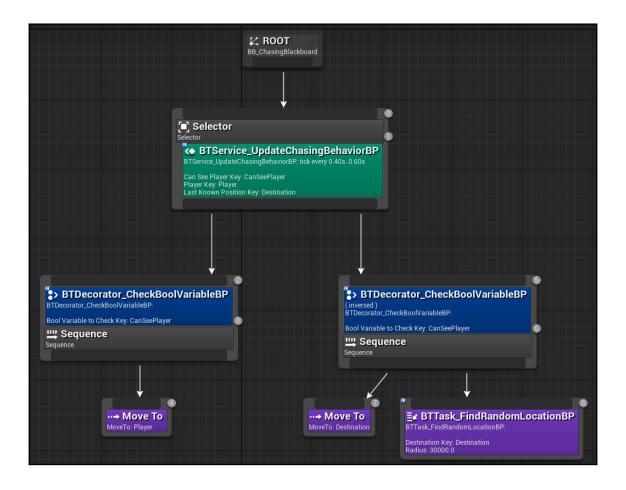
🚑 Details 🛛 🛛 🕹	
Search Details	Q 🗐 🔿 -
▲ Node	
Acceptable Radius	5,0
Filter Class	None 🕶 🔶 🔎 🕂 🗙
Allow Strafe	
Reach Test Includes Agent Radius	
Reach Test Includes Goal Radius	
Stop on Overlap	
	₹
▲ Blackboard	
Blackboard Key	Player 🔻 🖜
	₹
⊿ Task	
Ignore Restart Self	
▲ Description	
Node Name	Move To



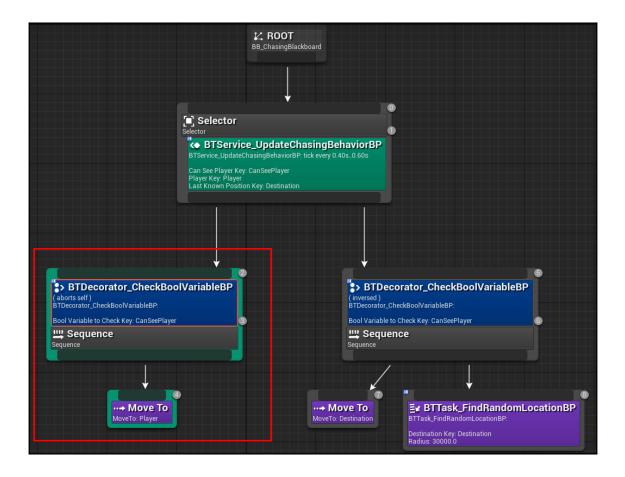


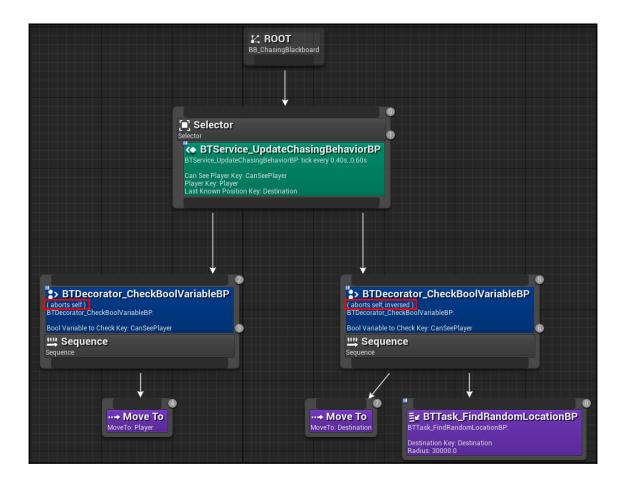


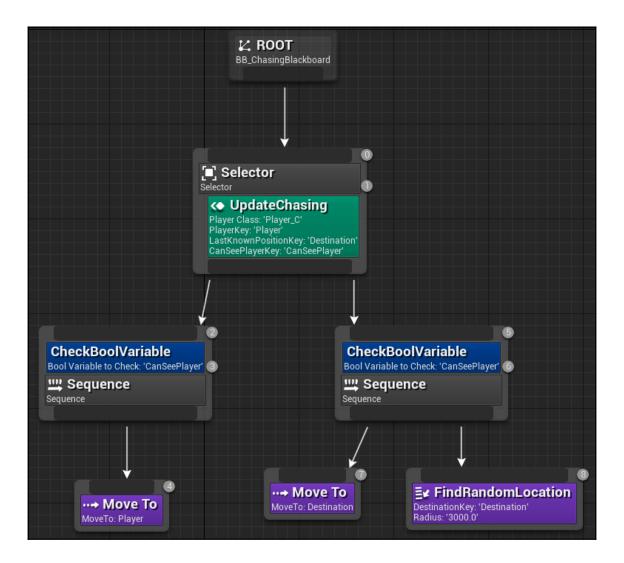




📮 Details 🛛 🛛 🛛		
Search Details		∽ ◙ 🔲 🔍
✓ Flow Control		
Observer aborts	Self 👻	5
▲ Default		
Bool Variable to Check K	CanSeePlayer 👻	ta I
Description		
Show Property Details	M	
Node Name		
Condition		
Inverse Condition		
Nodes aborted by mode: \$	Self	







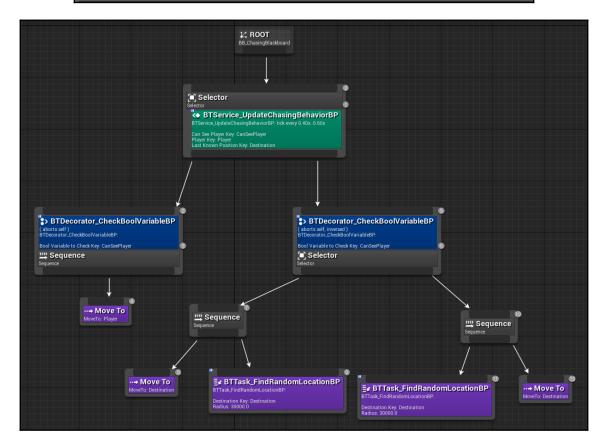
Run Chasing Behavior Tree		
Event BeginPlay	f Run Behavior Tree Target is AlController	
•	•	D
Concernence of the second	🔥 Target 🛛 self	Return Value 👝
	● BTAsset BT_ChasingBeha ▼ ◆ ●	

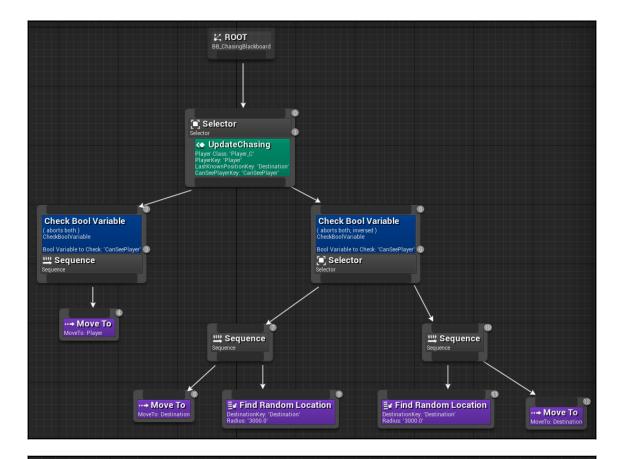
Ă	C++ Class Actions	
	🚬 Create C++ class derived from Cha	singAlController
ChasingAl	💦 🌉 Create Blueprint class based on Cl	nasingAlController
Controller	Common	
	🥕 Edit	
	Explore	
	🔎 Show in Folder View	Ctrl+B
	🔎 Show in Explorer	
	References	
	Copy Reference	
	Reference Viewer	Alt+Shift+R
	Size Map	Alt+Shift+M
	Audit Assets	Alt+Shift+A
	👑 Connect To Source Control	

U	Add Bluep	rint Class	×
Nan	ne Your New Chasing AlCont	troller	
	ame for your new class. Class names may only contain alphanumeric charac click the "Create" button below, a new Blueprint class will be created.	sters, and may not contain a space.	
Name	CPP_ChasingAlController		
Path	Search Folders		Q
	✓ ■ Content		
	▷ 🖬 Geometry ▷ 💼 Mannequin		
	D InirdPerson		
	🗅 🖿 ThirdPersonCPP		
	< Back	Create Blueprint Class	Cancel

C Details ×		
Search Details		∽ 🗉 🎗
▲ Actor Tick		
Start with Tick Enabled		
Tick Interval (secs)	0,0	
Allow Tick Before Begin Play		
Chasing AIController		
Behavior Tree	BT_ChasingBehavior → ← ♀ ⊐	

I ⊿ Pawn	
Use Controller Rotation Pitch	
Use Controller Rotation Yaw	
Use Controller Rotation Roll	
Can Affect Navigation Generation	
Auto Possess Player	Disabled 👻
Auto Possess Al	Placed in World or Spawned < 🤤
Al Controller Class	CPP_ChasingAlController - 🔶 🔎 🗙 🦻





≣r BTTask_FindRandomLocationBP

BTTask_FindRandomLocationBP:

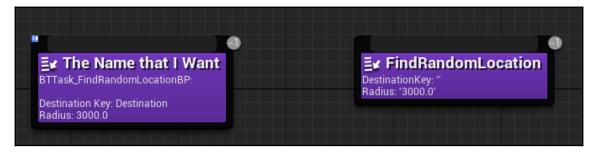
Destination Key: Destination Radius: 3000.0

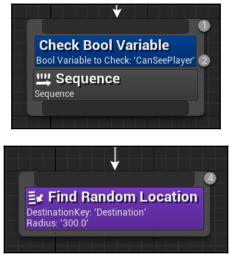
≣∉ FindRandomLocation

a

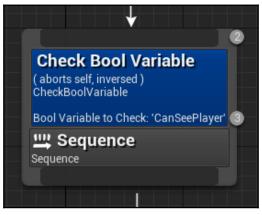
DestinationKey: 'Destination' Radius: '3000.0'

🍕 Details	×	
Search Details		⊤⊛ 🛄 Q
⊿ Default		
Destination Key	Destination 👻 🖜	
Radius	3000,0	
✓ Description		
Show Property Details	Image: A second seco	
Node Name	The Name that I Want	
⊿ Task		
Ignore Restart Self	•	









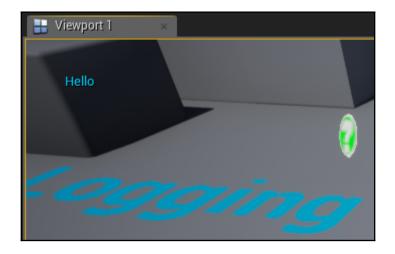
🧔 Details	×	
Search Details		0
▲ Flow Control		
Observer aborts	Self 🔹	t
Blackboard		
Bool Variable to Check	CanSeePlayer - CanSeePlayer	tı
Condition	· ·	
Inverse Condition	V •	
▲ Description		
Node Name	Check Bool Variable	

🚑 Details	×	
Search Details		⊤⊛ 🛄 Q
▲ Blackboard		
Destination Vector	Destination Destination	•
Parameters		
Radius	300,0 🖍	
⊿ Task		
Ignore Restart Self		
Description		
Node Name	Find Random Location)

📮 Details 🛛 🛛 🕹			
Search Details			Ω 📰 👁 -
▲ Player Class			
Player Class	Player 🔻 🔶 🇯	o + x ∍	
▲ Blackboard			
Can See Player Key	CanSeePlayer	- 1	
Player Key	Player	- 1	
Last Known Position Key	Player SelfActor	5	
▲ Service			
Interval	0,5	2	
Random Deviation	0,1	2	
Description			
Node Name	Update Chasing E	Behavior	

Chapter 11: Debugging Methods for AI - Logging

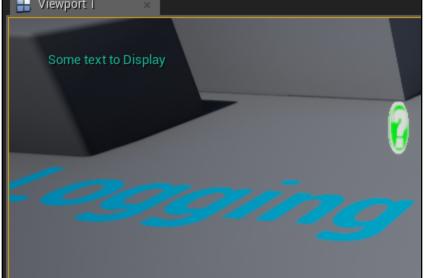




≥ Output Log ×
▼ Filters - Search Log
LogTemp: Repeating last play command: Selected Viewport LogBlueprintUserMessages: Early PlayInEditor Detection: Level '/Game/Chapter11/LoggingExampleMap LoggingExampleMap.LoggingExampleMap:PersistentLevel.LoggingExampleMap' LogPlayLevel: PlayLevel: No blueprints needed recompiling PIE: New page: PIE session: LoggingExampleMap (25/mar/2019 04:28:24) LogPlayLevel: Creating play world package: /Game/Chapter11/UEDPIE_0_LoggingExampleMap LogPlayLevel: PIE: StaticDuplicateObject took: (0.040138s) LogPlayLevel: PIE: StaticDuplicateObject took: (0.040138s) LogPlayLevel: PIE: World Init took: (0.002833s) LogPlayLevel: PIE: Created PIE world by copying editor world from /Game/Chapter11/LoggingExampl- LogInit: XAudio2 using '
Cmd - Enter Console Command

U	Add C++ Class	_	×
Choose Parent Cla	SS		
This will add a C++ header and source code file to	o your game project.		Show All Classes
 None An empty C++ class with a default construct Character	the ability to walk arour		
• Actor An Actor is an object that can be placed or	spawned in the world.		
🗞 Actor Component			
Selected Class Actor 🕑 Selected Class Source Actor.h			
	Next >	Create Class	Cancel

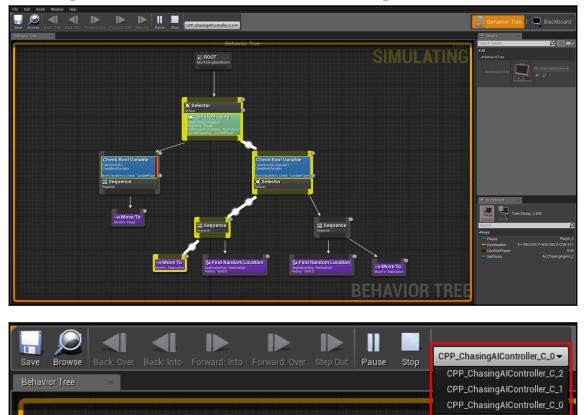
Name Your New Class names may only contain alphanumeric characters, and may not contain a space. When you click the "Create" button below, a header (.h) file and a source (.cpp) file will be made using this name. Name LoggingActor Path C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/ Header File C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/LoggingActor.h	
When you click the "Create" button below, a header (h) file and a source (cpp) file will be made using this name. Name LoggingActor Path C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/	
Path C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/	
	- Public Private
Header File C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/LoggingActor.h	Choose Folder
Source File C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter11/LoggingActor.cpp	
<back class<="" create="" td=""><td>Cancel</td></back>	Cancel
	_
🖶 Viewport 1 🛛 🖂	



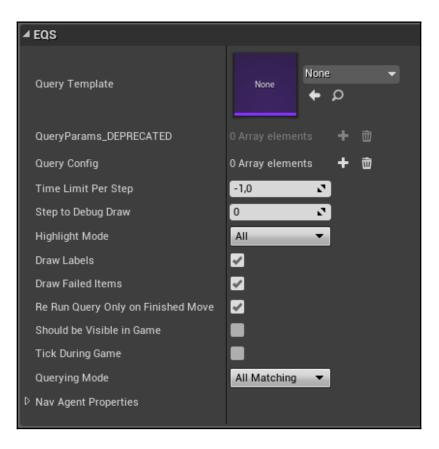
🔰 Output Log 🛛 🛛
▼ Filters - Search Log
PIE: New page: PIE session: LoggingExampleMap (25/mar/2019 05:22:11) LogPlayLevel: Creating play world package: /Game/Chapter11/UEDPIE_0_LoggingExampleMap LogPlayLevel: PIE: StaticDuplicateObject took: (0.045625s) LogAIModule: Creating AISystem for world LoggingExampleMap LogPlayLevel: PIE: World Init took: (0.003768s) LogPlayLevel: PIE: Created PIE world by copying editor world from /Game/Chapter11/LoggingExampl LogInit: XAudio2 using '
Cmd- Enter Console Command

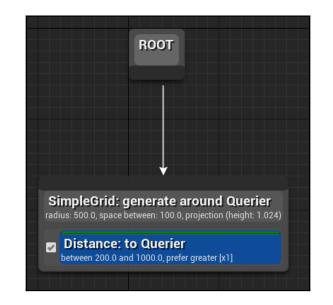
💫 Output Log 🛛 👋
▼ Filters → Search Log
PIE: New page: PIE session: LoggingExampleMap (27/mar/2019 04:42:11) LogPlayLevel: Creating play world package: /Game/Chapter11/UEDPIE_0_LoggingExampleMap LogPlayLevel: PIE: StaticDuplicateObject took: (0.038595s) LogAIModule: Creating AISystem for world LoggingExampleMap LogPlayLevel: PIE: World Init took: (0.003546s) LogPlayLevel: PIE: Created PIE world by copying editor world from /Game/Chapter11/LoggingExampl LogInit: XAudio2 using 'Altoparlanti (Realtek High Definition Audio)' : 2 channels at 48 kHz us LogInit: FAudioDevice initialized. LogLoad: Game class is 'UnrealAIBookGameMode' LogWorld: Bringing World /Game/Chapter11/UEDPIE_0_LoggingExampleMap.LoggingExampleMap up for pl LogWorld: Bringing up level for play took: 0.006359 MyAwesomeAILogCategory: I am logged from a custom Category! PIE: Play in editor start time for /Game/Lhapter11/UEDPIE_0_LoggingExampleMap 0,722 LogBlueprintUserMessages: Late PlayInEditor Detection: Level '/Game/Chapter11/LoggingExampleMap oggingExampleMap.LoggingExampleMap:PersistentLevel.LoggingExampleMap'
Cmd√ Enter Console Command

Chapter 12: Debugging Methods for AI - Navigation, EQS, and Profiling

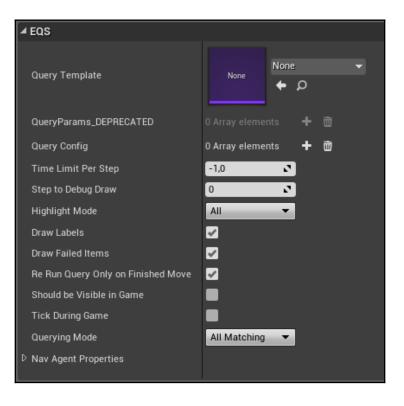


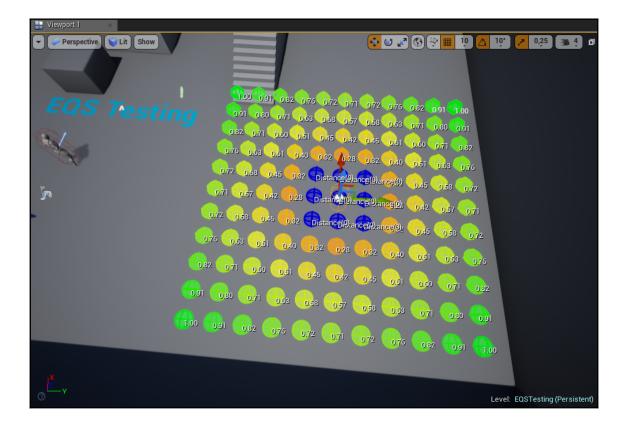
U	Pick Parent Class	×
▲ Common Classes		
Actor	An Actor is an object that can be placed or spawned in the world.	0
8 Pawn	A Pawn is an actor that can be 'possessed' and receive input from a controller.	0
Dharacter	A character is a type of Pawn that includes the ability to walk around.	0
📡 Player Controller	A Player Controller is an actor responsible for controlling a Pawn used by the player.	0
🔄 Game Mode Base	Game Mode Base defines the game being played, its rules, scoring, and other facets of the game type.	
langle Actor Component	An ActorComponent is a reusable component that can be added to any actor.	0
🔍 Scene Component	A Scene Component is a component that has a scene transform and can be attached to other scene components.	0
▲ All Classes		
EQSTestingPawn		X
⊿O Object		
Actor		
▲ Seawn ▲ Character		
EQSTestingPaw	<u>m</u>	
5 items (1 selected)	👁 View Op	tions -
	Select Can	cel

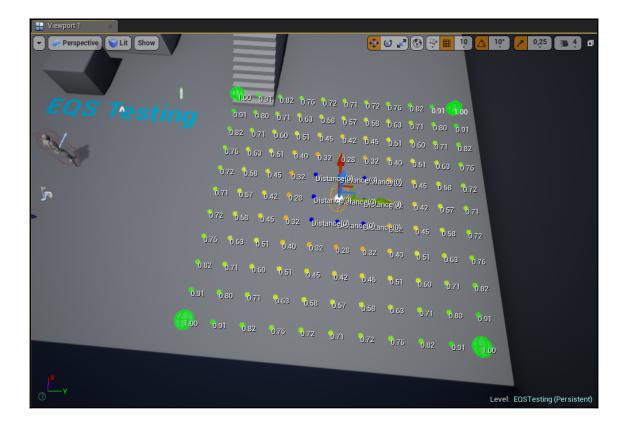


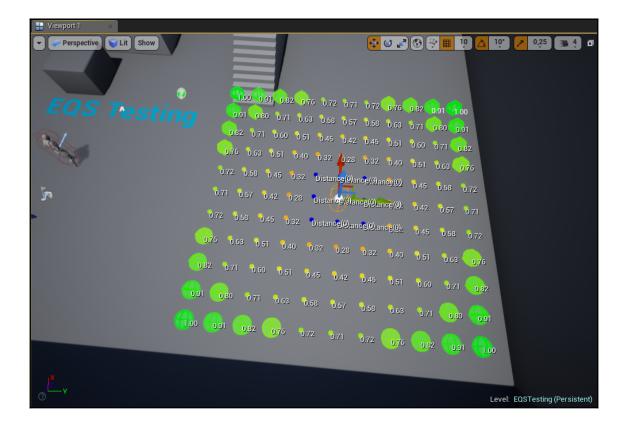


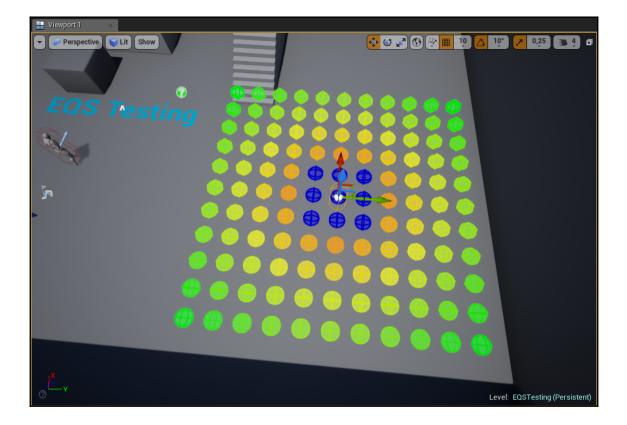
(1) Details	× 🔍 Profiler	×	
0			
Search Details			∽ ا 🛄 🔍
▲ Generator			
▷ GridHalfSize	500,0		2
▷ Space Between	100,0		2
Generate Around	EnvQueryCon	text_Querier 👻 🔶 🔎	× ×
▷ Projection Data	navmesh trace	e	
✓ Option			
Option Name			
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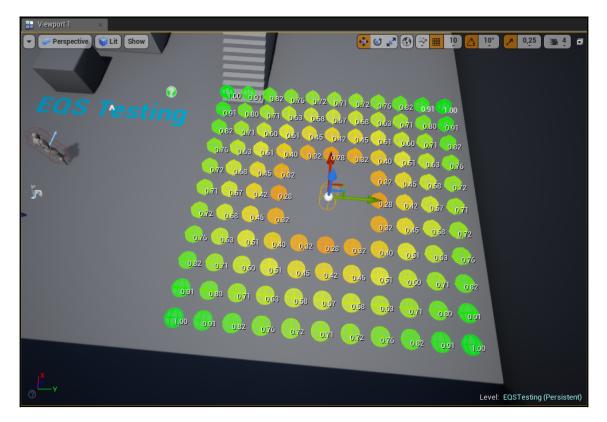




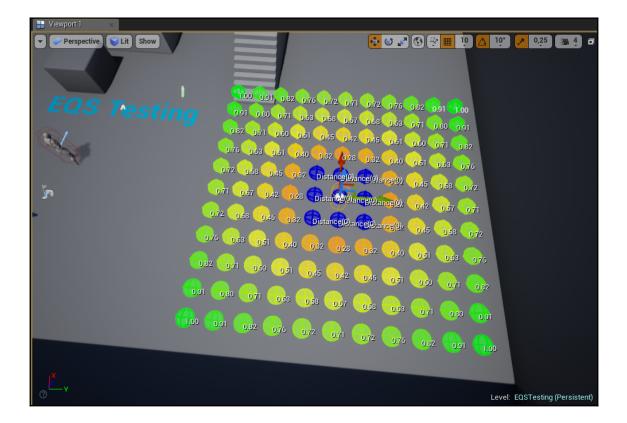


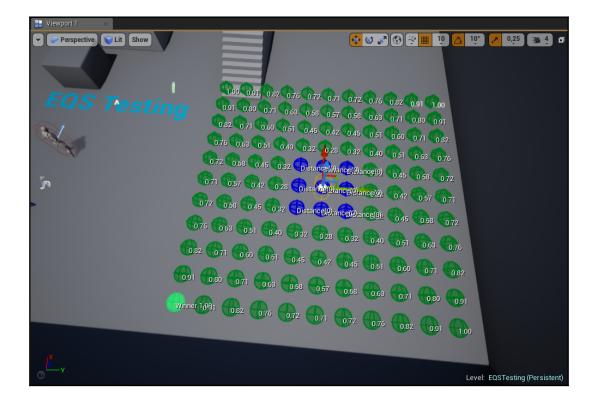


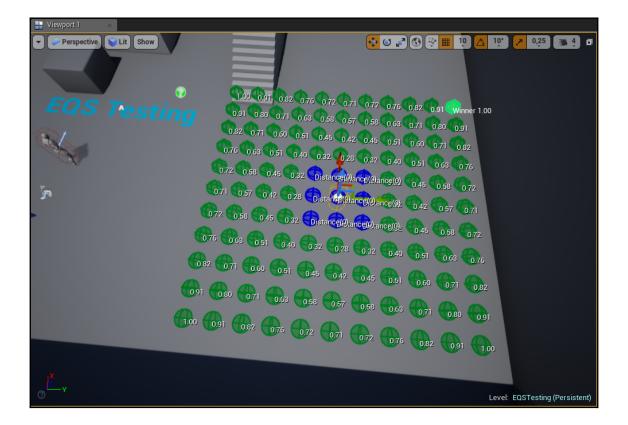


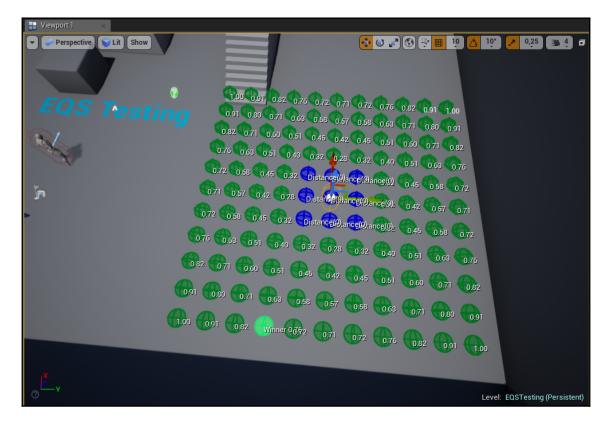


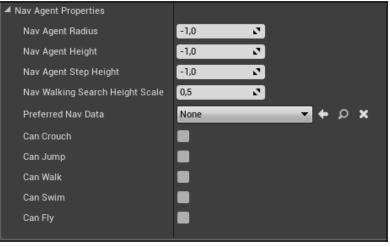


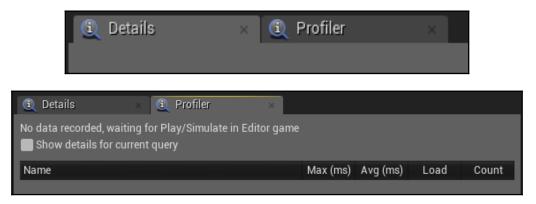






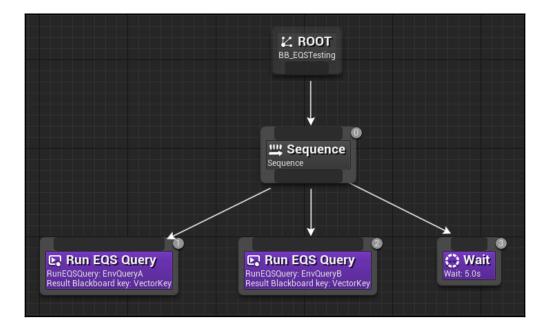


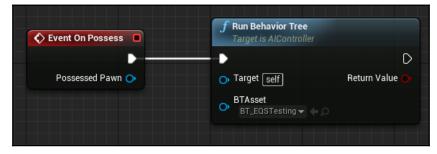


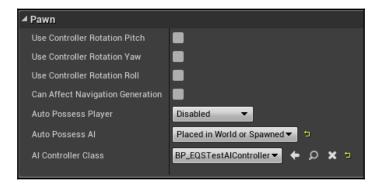






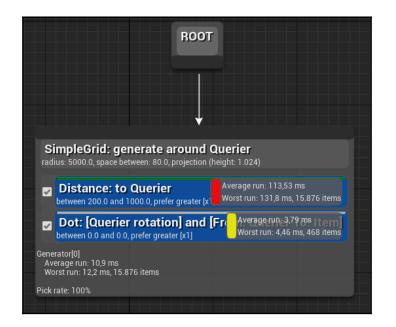


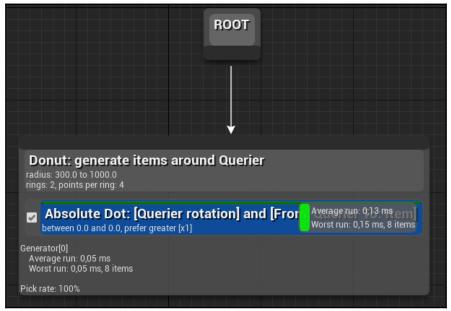


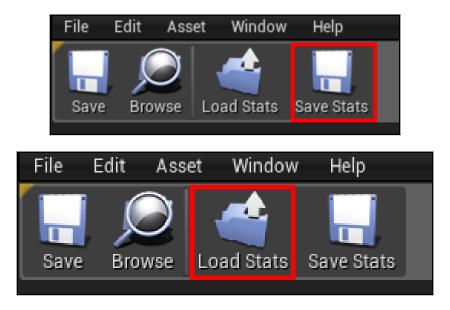


Details × Profiler × Number of recorded queries: 2 Show details for current query				
Name	Max (ms)	Avg (ms)	Load	Count
© EnvQueryA_SingleResult	169,16	112,15	6%	9
₽ EnvQueryB_SingleResult	1,03	0,24	0%	
Load of EQS tick budget for query: Envi	QueryA_Sing	gleResult (la:	st 1.733 fra	imes)

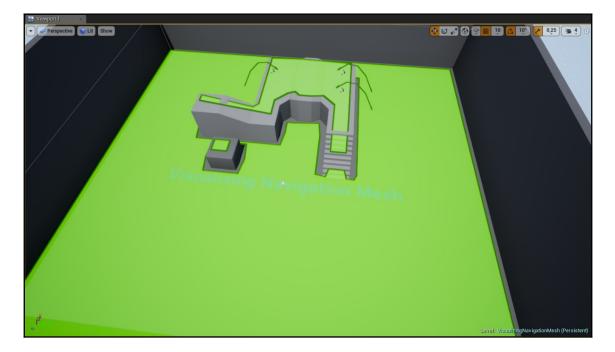
🗓 Details 🛛 🗴 🗓 Profile	er	×		
Number of recorded queries: 3				
Name	Max (ms)	Avg (ms)	Load	Count
© EnvQueryA_SingleResult	151,8	128,76		2
D EnvQueryB_AllMatching	0,15	0,15	2%	
$\mathcal O$ EnvQueryB_SingleResult	0,14	0,13	0%	2
Load of EQS tick budget for query: EnvQueryA_SingleResult (last 255 frames)				

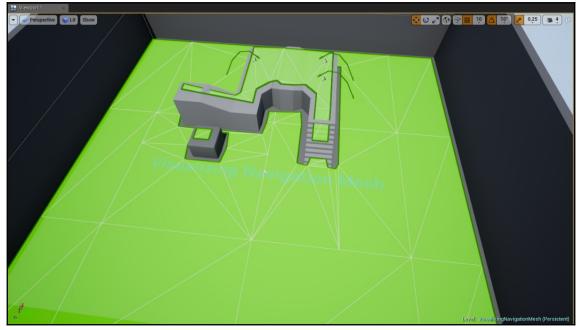


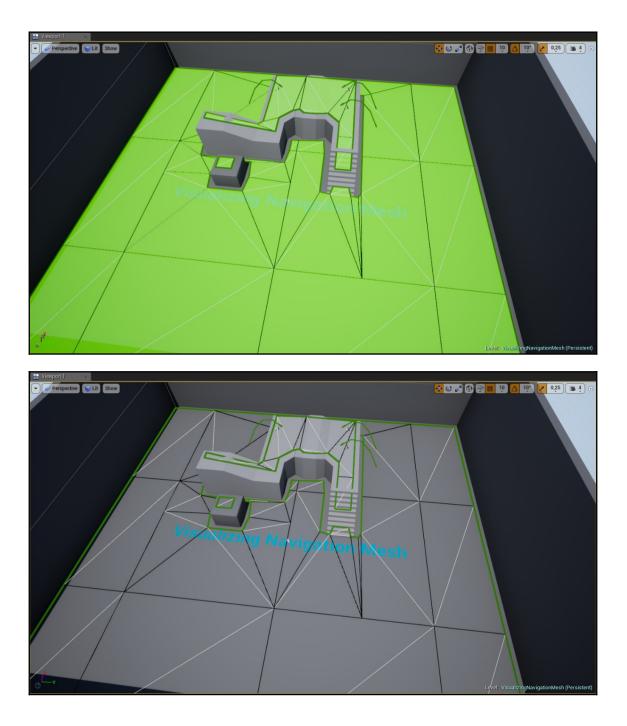


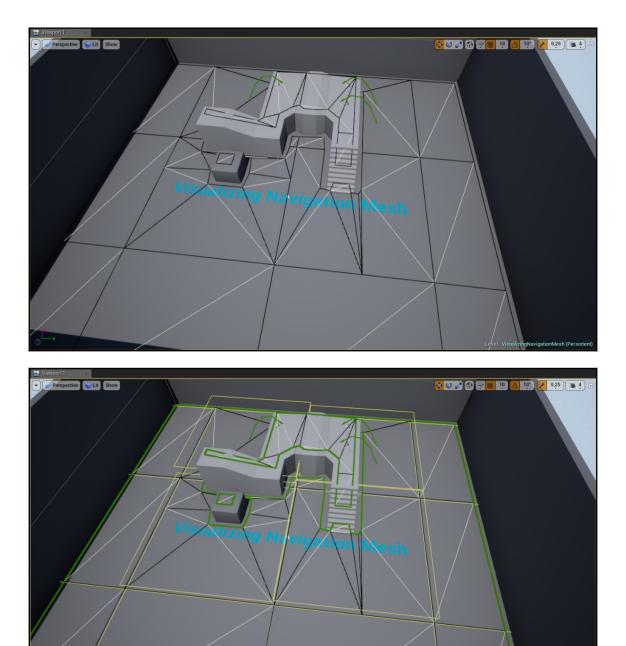


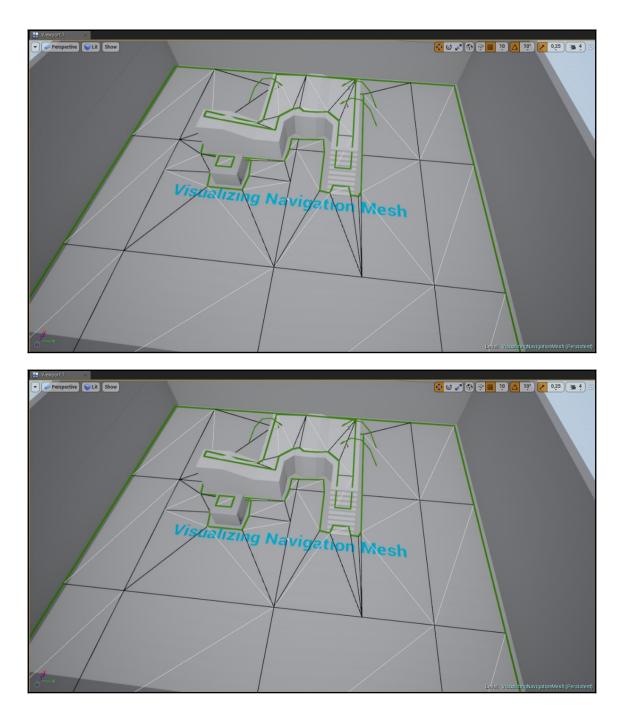
⊿ Display	
Draw Triangle Edges	
Draw Poly Edges	
Draw Filled Polys	V
Draw Nav Mesh Edges	v
Draw Tile Bounds	
Draw Path Colliding Geometry	
Draw Tile Labels	
Draw Polygon Labels	
Draw Default Polygon Cost	
Draw Labels on Path Nodes	
Draw Nav Links	✓
Draw Failed Nav Links	
Draw Clusters	
Draw Octree	
Draw Octree Details	
Draw Nav Mesh	✓
Draw Offset	10,0
Enable Drawing	2 5

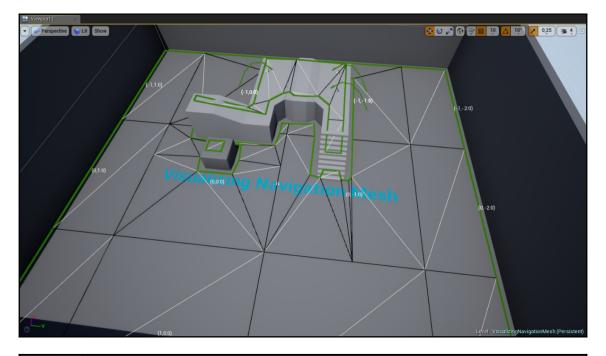


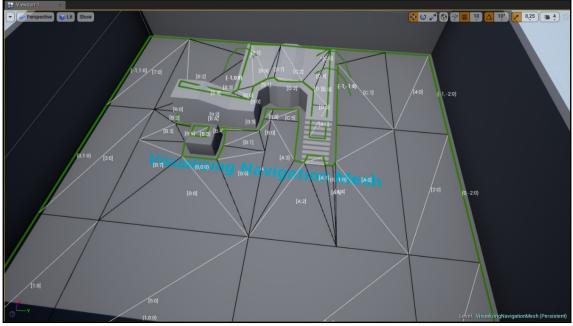


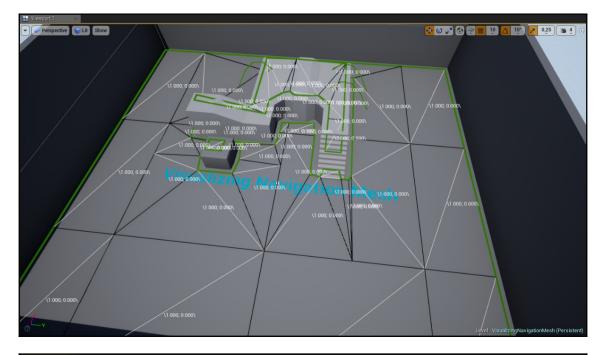


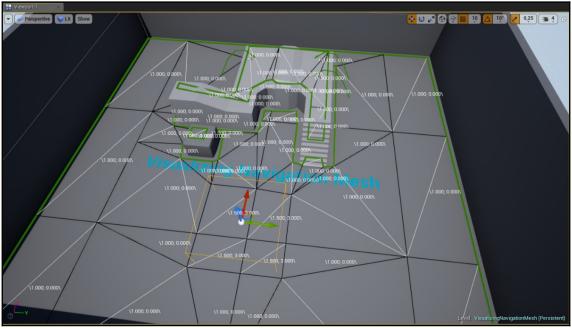


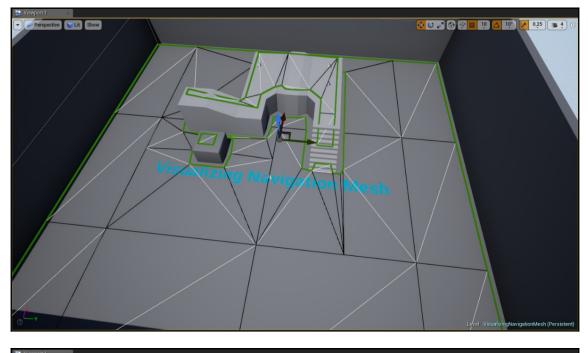


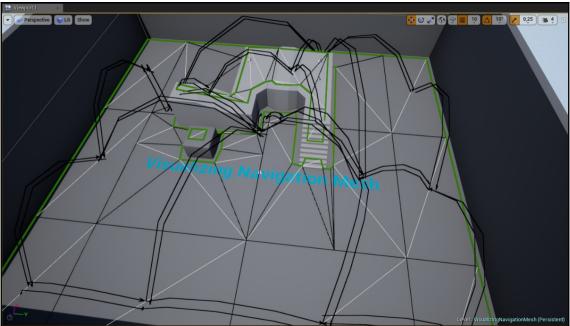


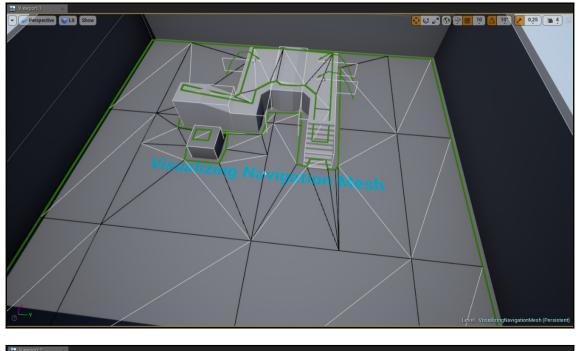


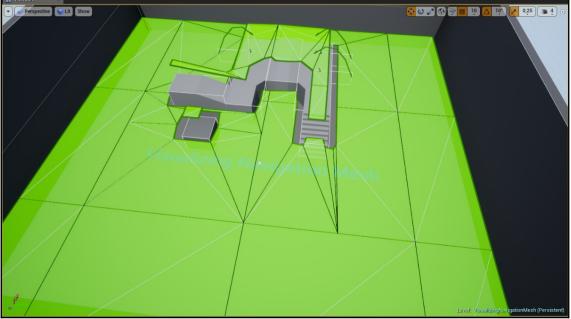


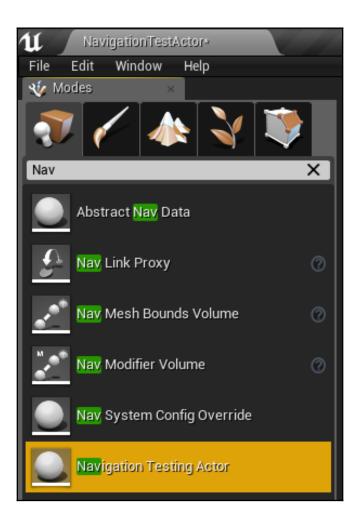


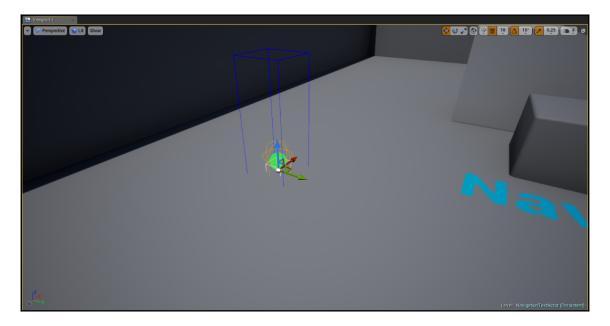






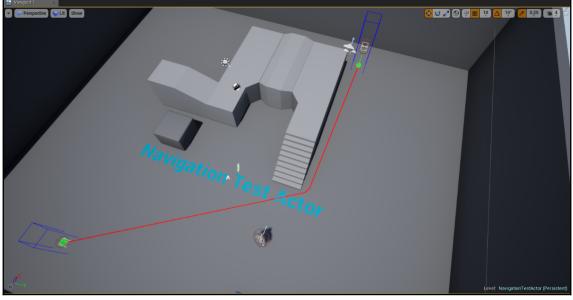


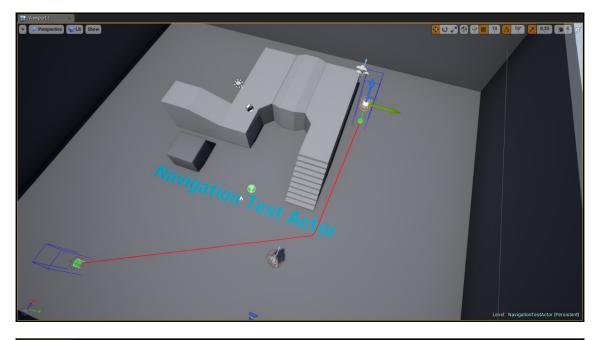


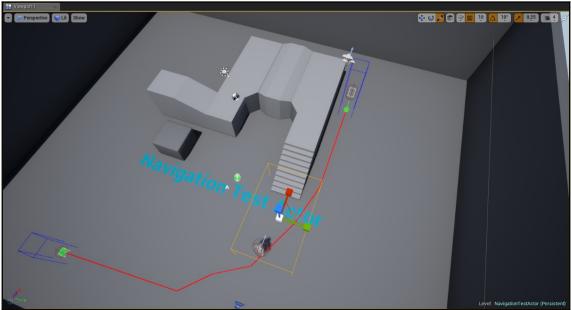


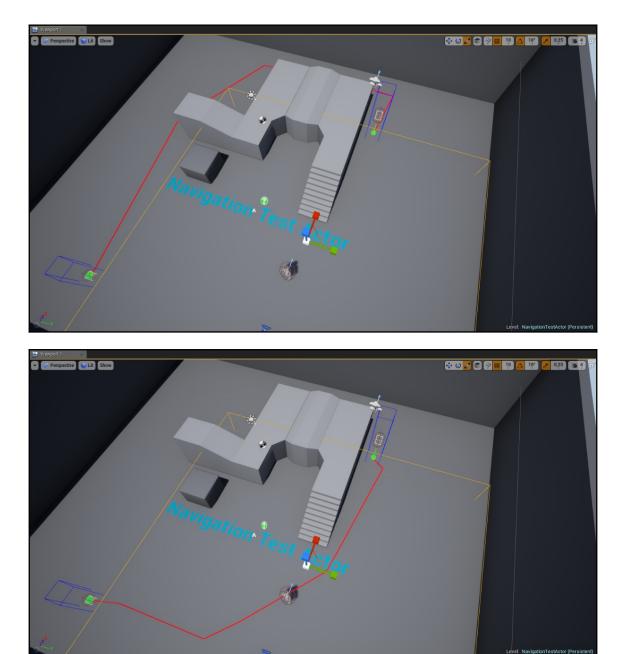
▲ Pathfinding	
Search Start	✓ □
Use Hierarchical Pathfinding	
Gather Detailed Info	✓
Other Actor	NavigationTestingActor1 🛛 🗸 👂 🗡 🗅
Filter Class	None 🗸 🔶 🔎 🕂 🗙
Offset from Corners Distance	0,0











Stat GameplayTags Stat Game

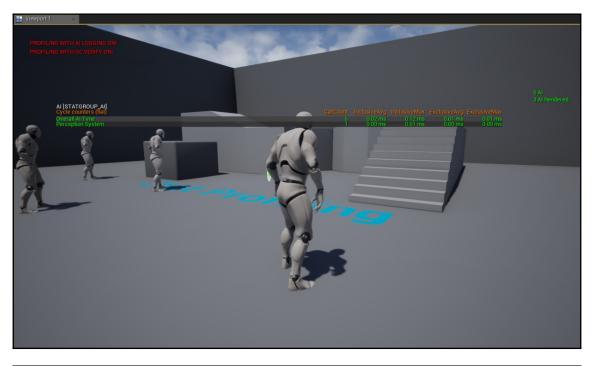
Displays game performance stats

> Stat Game

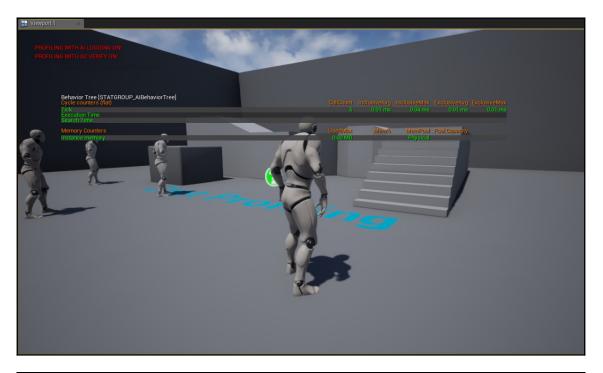


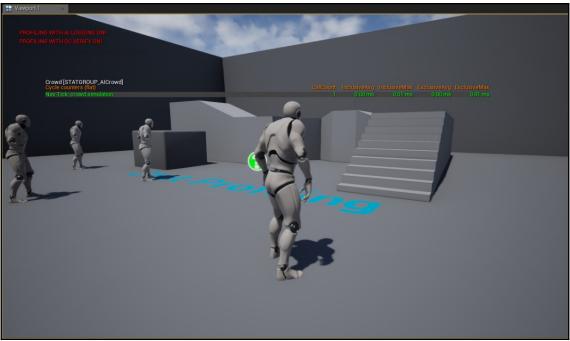
	[86 n	nore matches]
	Stat DDC	
	Stat D3D11RHI	Shows Direct3D 11 stats
ŀ	Stat CPUStalls	
	Stat CPULoad	Stat CPULoad (Shows CPU Utilization)
	Stat Compression	
	Stat Component	
	Stat CommandListMarkers	
	Stat CollisionTags	
	Stat Collision	
	Stat Character	
	Stat Canvas	
	Stat AudioThreadCommands	
	Stat Audio	
	Stat AsyncLoadGameThread	
	Stat AsyncLoad	
	Stat Anim	
	Stat AICrowd	
	Stat AlBehaviorTree	
	Stat AI_EQS	
	Stat Al	
>	Stat_Al	

Stat AICrowd Stat AIBehaviorTree Stat AI_EQS Stat AI > Stat AI_







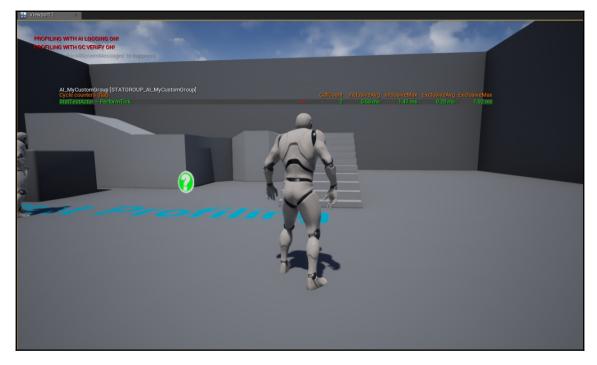


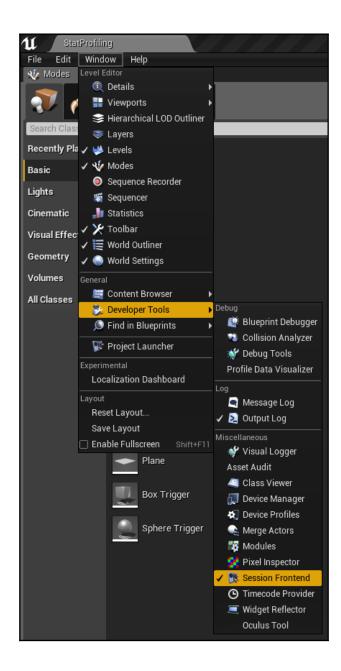


۹. A	dd C++ Class		×
Choose Parent Class			
This will add a C++ header and source code file to your ga	me project.		Show All Classes
O None An empty C++ class with a default constructor and c	destructor.		
Character A character is a type of Pawn that includes the abilit	ty to walk around.		
♣ Pawn A Pawn is an actor that can be 'possessed' and rece	eive input from a contro	oller.	
• Actor An Actor is an object that can be placed or spawned	l in the world.		
Sector Component			
Selected Class Actor 🕜 Selected Class Source Actor h			
	Next >	Create Class	Cancel

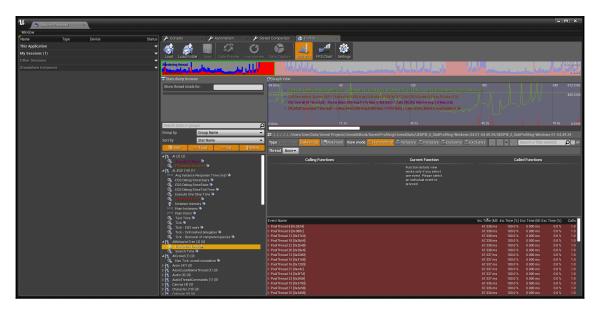
U	Add C++ Class		×
Name	Your New Actor		
	your new class. Class names may only contain alphanumeric characters, and may not contain a space e "Create" button below, a header (.h) file and a source (.cpp) file will be made using this name.		
Name	TestingStatActor	UnrealAIBook (Runtime) 🕶	Public Private
Path	C:/Users/User/Data/Unreal Projects/UnrealAlBook/Source/UnrealAlBook/Chapter12/		Choose Folder
Header File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter12/TestingStatActor	or.h	
Source File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Source/UnrealAIBook/Chapter12/TestingStatActor	ог.срр	
_			_
	< Back	Create Class	Cancel







11 🕵 Session From	itend ×									- - X
Window										
Name	Туре	Device	Status	🎾 Console	× 🎾 Automation	× 🎾 🌽 Screen	Comparisor ×	😚 Profiler 🛛 🛛 🗙		
This Application			-							
My Sessions (1)			₹	Copy Clear Log	Savelog					
			-							
			-	Instance		Seconds	M	lessage		
						Please select at lea	ist one instance	from the Session Browser		
									Send Command	Promote to Shortcut



Chapter 13: Debugging Methods for AI - The Gameplay Debugger



Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages Tab:Spectator 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:NavGrid 5:Perception

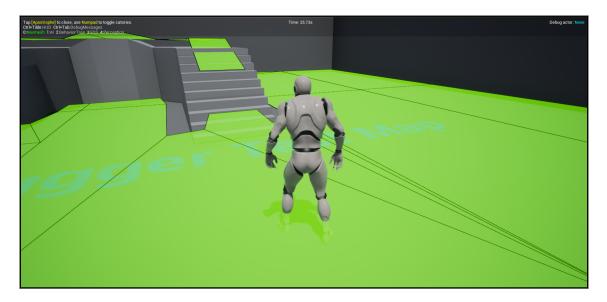
[CATEGORY: AI]

Controller Name: BP_GamplayDebuggerAlController_C_0 Pawn Name: ThirdPersonCharacter2 Movement Mode: Walking, Base: Floor.StaticMeshComponent0 NavData: Default, Path following: Idle Behavior: Running, Tree: BT_GameplayDebuggerTest Active task: Wait[3] Gameplay tasks: 0 Montage: None

[CATEGORY: BehaviorTree]

Brain Component: BTComponent Behavior tree: BT_GameplayDebuggerTest 0. Sequence [Sequence] 3. Wait [Wait: 5.0s], remaining: 1.165398s

Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages Tab:Spectator 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:NavGrid 5:Perception





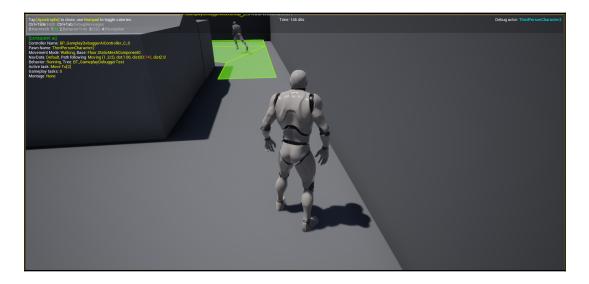
Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:Al 2:BehaviorTree 3:EQS 4:Perception [CATEGORY: Al] Controller Name: BP_GamplayDebuggerAlController_C_0

Controller Name: BP_GamplayDebuggerAlController_C_0 Pawn Name: ThirdPersonCharacter2 Movement Mode: Walking, Base: Floor.StaticMeshComponent0 NavData: Default, Path following: Idle Behavior: Running, Tree: BT_GameplayDebuggerTest Active task: Wait[3] Gameplay tasks: 0 Montage: None

Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD_Ctrl+Tab:DebugMessages 0:Navmesh 1:AF 2:BehaviorTree 3:EQS_4:Perception

[CATEGORY: AI]

Controller Name: BP_GamplayDebuggerAIController_C_0 Pawn Name: ThirdPersonCharacter2 Movement Mode: Walking, Base: Floor.StaticMeshComponent0 NavData: Default, Path following: Moving (1..2/2), dot:1.00, dist2D:745, dist2:8 Behavior: Running, Tree: BT_GameplayDebuggerTest Active task: Move To[2] Gameplay tasks: 0 Montage: None

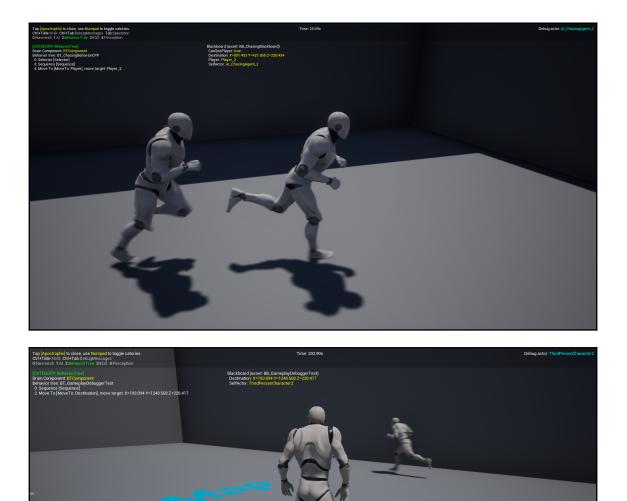


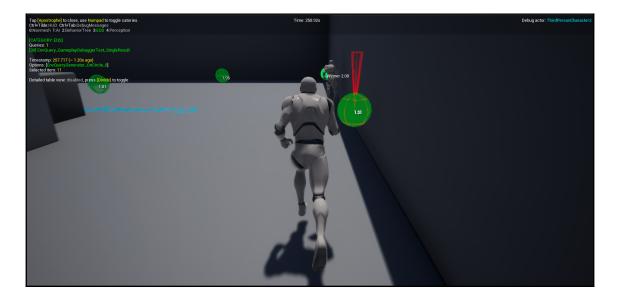


Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:Perception

[CATEGORY: BehaviorTree] Brain Component: BTComponent Behavior tree: BT_GameplayDebuggerTest 0. Sequence [Sequence] 3. Wait [Wait: 5.0s], remaining: 1.785686s

Blackboard (asset: BB_GameplayDebuggerTest) Destination: X=-1763.001 Y=-368.344 Z=228.417 SelfActor: ThirdPersonCharacter2





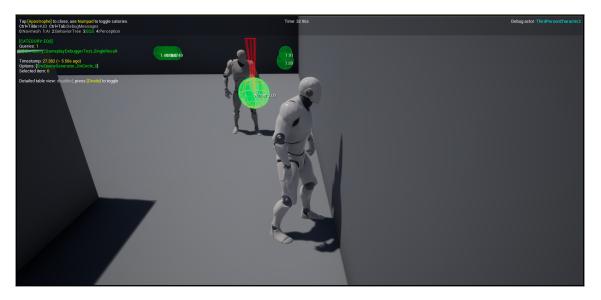
Tap <mark>[Apostrophe]</mark> to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:Perception

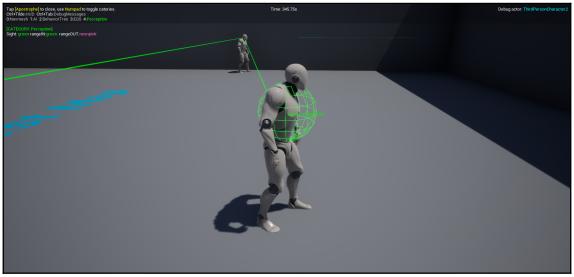
[CATEGORY: EQS] Queries: 1 [39] EnvQuery_GameplayDebuggerTest_SingleResult

Timestamp: 257.717 (~ 1.20s ago) Options: [EnvQueryGenerator_OnCircle_0] Selected item: 11

Detailed table view: disabled, press [Divide] to toggle

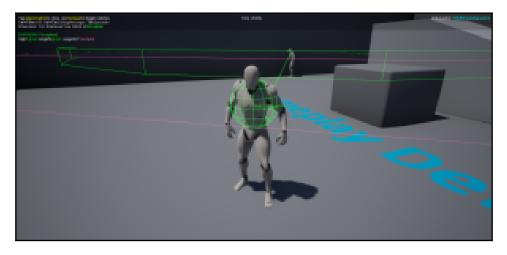
1.81

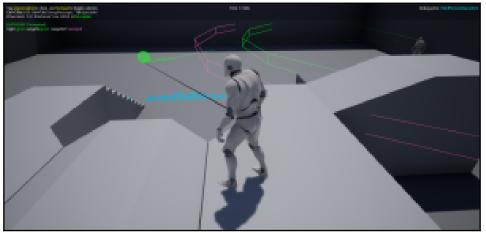


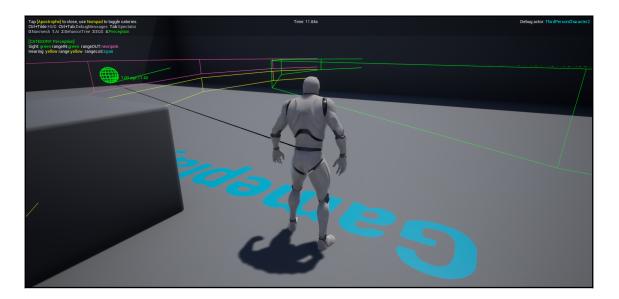


Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:Perception

[CATEGORY: Perception] Sight: green rangeIN:green rangeOUT:neonpink





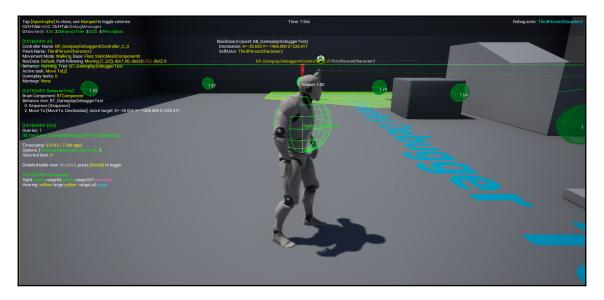


Tap [Apostrophe] to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:Perception

[CATEGORY: Perception] Sight: green rangelN:green rangeOUT:neonpink Hearing: yellow range:yellow rangeLoS:cyan

Tap <mark>(Apostrophe)</mark> to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:NavGrid 5:Perception

[CATEGORY: NavGrid] Num sources: 0



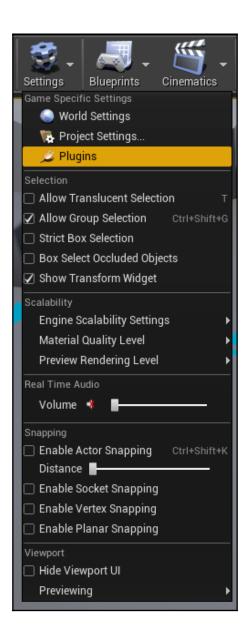
11 💦 Project Settings 🛛					×
oamepiay rags Maps & Modes	Search Details				∽⊚ Ω
Movies	Engine - Gameplay Deb	ugger			
Packaging	Settings for the gameplay debugger tool.		Set as Default	Export Import	Reset to Defaults
Supported Platforms	∩ These settings are saved in DefaultEngine.in	i, which is currently writable.			
Target Hardware	⊿ Input				
Game	Activation Key	Apostrophe 👻			
Asset Manager	Category Row Next Key	Num + 🔻			
	Category Row Prev Key	🚊 Num - 🔍 🔻			
Engine	Category Slot 0	💭 Num 0 🔫			
AI System	Category Slot 1	Num 1 👻			
Animation	Category Slot 2	Num 2 💌			
Audio	Category Slot 3	🚊 Num 3 🛛 🔻			
Collision	Category Slot 4	🚊 Num 4 🛛 🔻			
Console	Category Slot 5	🚊 Num 5 🛛 👻			
Cooker	Category Slot 6	💻 Num 6 🛛 👻			
Crowd Manager	Category Slot 7	Num 7 🔍			
Gameplay Debugger	Category Slot 8	Num 8			
Garbage Collection	Category Slot 9	Num 9 👻			
General Settings					
Hierarchical LOD	⊿ Display				
Input	Debug Canvas Padding Left	10,0			
Navigation Mesh	Debug Canvas Padding Right	10,0			
Navigation System	Debug Canvas Padding Top	10,0			
Network	Debug Canvas Padding Bottom	10,0 🔊			

⊿ Input	
Activation Key	Apostrophe 🔻
Category Row Next Key	🚊 Num + 🛛 🔻
Category Row Prev Key	🚊 Num - 🛛 🔻
Category Slot 0	🚊 Num 0 🛛 🔻
Category Slot 1	🚊 Num 1 🛛 🔻
Category Slot 2	🚊 Num 2 👻
Category Slot 3	🚊 Num 3 🛛 🔻
Category Slot 4	🚊 Num 4 🛛 🔻
Category Slot 5	🚊 Num 5 🛛 🔻
Category Slot 6	🚊 Num 6 🛛 🔻
Category Slot 7	🚊 Num 7 🛛 🔻
Category Slot 8	🚊 Num 8 👻
Category Slot 9	₩Num 9 👻

⊿ Display		
Debug Canvas Padding Left	10,0	2
Debug Canvas Padding Right	10,0	2
Debug Canvas Padding Top	10,0	2
Debug Canvas Padding Bottom	10,0	2

⊿ Add Ons	
▲ Categories	6 Array elements
	[1]:AI
	[2]:BehaviorTree
₿Þ2	[-]:EQS
<u> </u> ⊳3	[0]:Navmesh
<u>∦</u> ⊳4	[-]:Perception
∄Þ5	[-]:NavGrid
▲ Extensions	2 Array elements
	GameHUD
	Spectator

[CATEGORY: Locator] If a DebugActor is selected, this is its position: Location: X=908.544 Y=515.342 Z=228.417

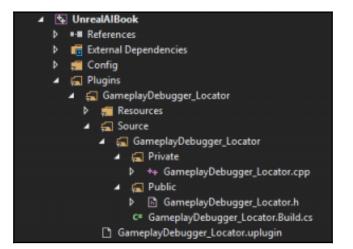


11 New Plugin		- 🗆 X
Choose a template a	and then specify a name to create a new plugin.	
/:	Blank Create a blank plugin with a minimal amount of code. Choose this if you want to set everything up from scratch or are making a non-visual plugin. A plugin created with this template will appear in the Editor's plugin list but will not register any buttons or menu entries.	
/:	Content Only Create a blank plugin that can only contain content.	
/:	Blueprint Library Create a plugin that will contain Blueprint Function Library. Choose this if you want to create static blueprint nodes.	
	Editor Toolbar Button	
	C:\Users\User\Data\Unreal Projects\UnrealAlBook\Plugir Plugin Name Folder Name	
▲ Descriptor Data		
Author Description		
	Cre	aite Plugin

1 New Plugin	X	- - X
CONCERNING OF THE OWNER	and then specify a name to create a new plugin.	
choose a template a	anu men spechy a name to create a new prugin.	
* *	Blank Create a blank plugin with a minimal amount of code.	
1	Cheate a brank plugin with a minima amount of code. Choose this if you want to set everything up from scratch or are making a non-visual plugin.	
	A plugin created with this template will appear in the Editor's plugin list but will not register any buttons or menu entries.	
	Content Only	
·/*	Create a blank plugin that can only contain content.	
		•
	Blueprint Library	
,.	Create a plugin that will contain Blueprint Function Library.	
	Choose this if you want to create static blueprint nodes.	
	C:\Users\User\Data\Unreal Projects\UnrealAlBook\Plugins\ GameplayDebugger_Locator	
	Folder Name	
▲ Descriptor Data		
Author Description	Francesco Sapio 💿 A custom Gameplay Debugger Category for visualizing the position of an Actor. 📁	
	▼	
🖌 Show Content Direct	tory	
		Create Plugin

U	New Plugin		- - X
1	Choose a template a	nd then specify a name to create a new plugin.	
	/:-	Blank Create a blank plugin with a minimal amount of code. Choose this if you want to set everything up from scratch or are making a non-visual plugin. A plugin created with this template will appear in the Editor's plugin list but will not register any buttons or menu entries.	
	/:	Content Only Create a blank plugin that can only contain content.	
	/:-	Blueprint Library Create a plugin that will contain Blueprint Function Library. Choose this if you want to create static blueprint nodes.	
		C:\Users\User\Data\Unreal Projects\UnrealAlBook\Plugins\ GameplayDebugger_Locator Folder Name	
А	escriptor Data uthor lescription	Francesco Sapio Contraction of an Actor.	
~ :	Show Content Directo		Create Plugin





🕊 💉 Plugins	×				- - ×
Hessaging	(3)	Project		Search	Q
Misc			GameplayDebugge	r_Locator	Version 1.0
Mobile		*,*.	A custom Gameplay Debugger	Category for visualizing the position of an Actor.	
Hovie Capture		/ 🍋 –			
Movie Players					
Networking			🛩 Enabled	Edit Package	👤 Francesco Sapio
Notifications					
🖸 Online Platform					
🔁 Other					
Performance					
🖬 Photography					
T Physics					
🐨 PreLoadScreenMovie	Pla (1)				
Programming	(11)				
- Rendering	(8)				
Scripting	(3)				
Source Control	(3)				
Testing	(5)				
🖬 Unreal Studio	(2)				
Virtual Production	(1)				
🖬 Virtual Reality	(10)				
Widgets	(1)				
🛾 🥹 Project	(1)				
🔁 Other	(1)				
					New Plugin

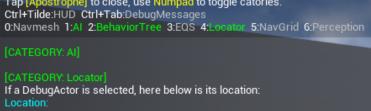
U Add C++ Class			×
Choose Parent Class			
This will add a C++ header and source code file to your game project.			Show All Classes
• None An empty C++ class with a default constructor and destructor.			
Character A character is a type of Pawn that includes the ability to walk around.			
Pawn A Pawn is an actor that can be 'possessed' and receive input from a controller.			
 Actor An Actor is an object that can be placed or spawned in the world. 			
An Actor Component is a reusable component that can be added to any actor			
Selected Class None Selected Class Source			
	Next >	Create Class	Cancel

Add C++ Class		×
Your New Class		
GameplayDebuggerCategory_Locator	GameplayDebugger_Locator (Runtime) -	Public Private
C:/Users/User/Data/Unreal Projects/UnrealAlBook/Plugins/GameplayDebugger_Loc	ator/Source/GameplayDebugger_Locator/	Choose Folder
C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Loca	ator/Source/GameplayDebugger_Locator/Publi	c/GameplayDebı
C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Loca	ator/Source/GameplayDebugger_Locator/Priva	te/GameplayDeb
Back	Create Class	Cancel
y	Your new class. Class names may only contain alphanumeric characters, and may not te "Create" button below, a header (h) file and a source (cpp) file will be made using th GameplayDebuggerCategory_Locator C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Loca C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Loca	Your new class. Class names may only contain alphanumeric characters, and may not contain a space. he "Create" button below, a header (h) file and a source (.cpp) file will be made using this name. GameplayDebuggerCategory_Locator GameplayDebugger_Locator/Source/GameplayDebugger_Locator/Runtime) - C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Locator/Source/GameplayDebugger_Locator/Public C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Locator/Source/GameplayDebugger_Locator/Priva

11 🕞 Project Settings 🔹		- - X
0	Search Details	- ح و 📿
Game	⊿ Display	
Asset Manager	Debug Canvas Padding Left	10,0
Engine	Debug Canvas Padding Right	10,0
	Debug Canvas Padding Top	10,0
Al System	Debug Canvas Padding Bottom	10,0
Animation		
Audio	▲ Add Ons	
Collision	▲ Categories	7 Array elements
Console		[1]:AI
Cooker		[2]:BehaviorTree
Crowd Manager		[-]:EQS
Gameplay Debugger		[0]:Navmesh
Garbage Collection		[-]:Perception
General Settings	₿D 5	[-]:NavGrid
Hierarchical LOD	∦ ⊿ 6	[-]:Locator
Input		-1
Navigation Mesh	Active in Game	Use Default 👻
Navigation System	Active in Simulate	Use Default 👻
Network	Hidden	Use Default 👻
Physics	Override Slot ldx	
Rendering	Input Handlers	0 Array elements
Rendering Overrides (Local)	▲ Extensions	2 Array elements
Slate Settings		GameHUD
Streaming		Spectator
Tutoriale		

۹dd C+	+ Class		×
Choose Parent Class			
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S Actor Component			
Selected Class None Selected Class Source			
	Next>	Create Class	Cancel

11 🙀 Modules	× ×	
Locator	×	
Module	Actions	
GameplayDebugger_Locator	Unload Reload Recompile	
Tap (Apostrophe) to cl Ctrl+Tilde:HUD Ctrl+T	lose, use Numpad to toggle catories. Tab:DebugMessages	

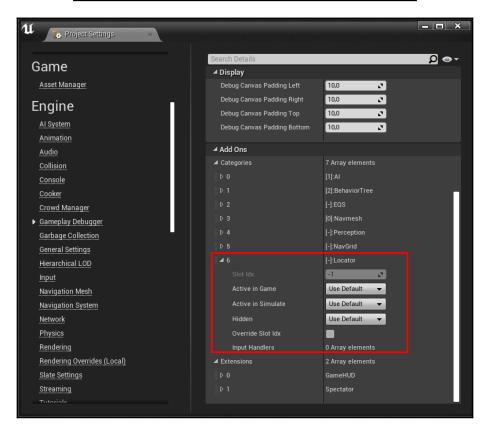




[CATEGORY: Locator] If a DebugActor is selected, this is its position: Location: X=908.544 Y=515.342 Z=228.417

U	Add C++ Class	X
Name	Your New Class	
	r your new class. Class names may only contain alphanumeric characters, and may not co he "Create" button below, a header (.h) file and a source (.cpp) file will be made using this	
Name	GameplayDebuggerCategory_Locator	GameplayDebugger_Locator (Runtime) → Public Private
Path	C:/Users/User/Data/Unreal Projects/UnrealAlBook/Plugins/GameplayDebugger_Locat	or/Source/GameplayDebugger_Locator/ Choose Folder
Header File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Locato	or/Source/GameplayDebugger_Locator/Public/GameplayDebu
Source File	C:/Users/User/Data/Unreal Projects/UnrealAIBook/Plugins/GameplayDebugger_Locato	or/Source/GameplayDebugger_Locator/Private/GameplayDeb
	Back	Create Class Cancel







Tap <mark>[Apostrophe]</mark> to close, use Numpad to toggle catories. Ctrl+Tilde:HUD Ctrl+Tab:DebugMessages P:Player 0:Navmesh 1:AI 2:BehaviorTree 3:EQS 4:Locator 5:Perception

[CATEGORY: AI]

Controller Name: BP_GamplayDebuggerAlController_C_0 Pawn Name: ThirdPersonCharacter2 Movement Mode: Walking, Base: Floor.StaticMeshComponent0 NavData: Default, Path following: Idle Behavior: Running, Tree: BT_GameplayDebuggerTest Active task: Wait[3] Gameplay tasks: 0 Montage: None

▶ Output Log ×
T Filters - Search Log
LogLoad: Game Class is 'UnrealAlBookGameWode' LogWorld: Bringing World /Game/Chapter13/UEDPIE_O_GameplayDebuggerTestWap.GameplayDebu, LogWorld: Bringing up level for play took: 0.002033 PIE: Play in editor start time for /Game/Chapter13/UEDPIE_O_GameplayDebuggerTestWap -O LogBlueprintUserWessages: Late PlayInEditor Detection: Level '/Game/Chapter13/GameplayI 'with ClassGeneratedDy '/Game/Chapter13/GameplayDebuggerTestWap.GameplayDebuggerTestW. LogTemp: Warning: Player's Location: X=-618.814 Y=209.479 Z=228.417 LogTemp: Warning: Player's Location: X=-618.814 Y=209.479 Z=228.417 LogSlueprintUserWessages: Early EndPlayMap Detection: Level '/Game/Chapter13/GameplayDebuggerTestWap Game/LagTemp: Warning: Player's Location: X=-618.814 Y=209.479 Z=228.417 LogSlueprintUserWessages: Early EndPlayMap Detection: Level '/Game/Chapter13/GameplayDebuggerTestWap Game/Chapter13/Game/Chapter13/GameplayDebuggerTestWap.GameplayDebuggerTestWap LogSlate: Updating window title bar state: overlay mode, drag disabled, window buttons LogBlueprintUserWessages: Late EndPlayWap Detection: Level '/Game/Chapter13/GameplayDebuggerTestWap LogSlate: Updating window title bar state: overlay mode, drag disabled, window buttons LogSlate: Updating window title bar state: overlay mode, drag disabled, window buttons LogSlate: Updating window title bar state: overlay mode, drag disabled, window buttons LogSlate: Updating window title bar state: overlay mode, drag disabled, window buttons LogSlate: Display: Destroying online subsystem :Context_3 LogSlate: FSceneViewport::OnFocusLost() reason 0 LogSlate: FSceneViewport::OnFocusLost() reason 0 LogRenderer: Reallocating scene render targets to support 1208x540 Format 10 NumSample: LogRenderer: Reallocating scene render targets to support 1208x540 Format 10 NumSample:
Cmd- Enter Console Command

Going Beyond

