

Tower Defense 2D

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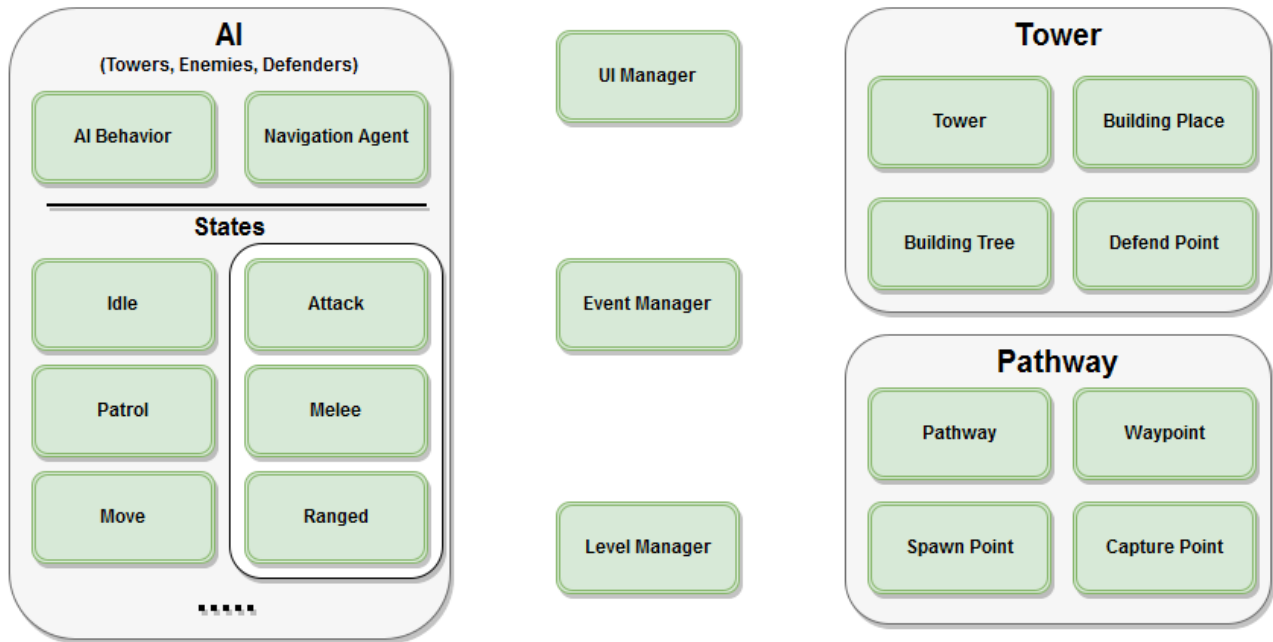
Demo

The following scenes are available:

- MainMenu - initial UI scene with “Start New Game” option;
- Level1 - scene with game level on simplest tower defense map.

Run “MainMenu” scene for asset's features demonstration.

Code organization overall chart



Scripts description

EventManager

This is a little modified code from Unity3d tutorials. It uses to organize data transactions for all code parts without dependencies between each other.

<https://unity3d.com/ru/learn/tutorials/topics/scripting/events-creating-simple-messaging-system>

There are next events in game:

- UnitDie – triggers when any unit dies;
- Captured – enemy reaches capture point;
- AllEnemiesAreDead – every spawn point will send this event when all specified enemies are dead;
- UserClick – user click action occurred;
- SceneQuit – new scene will load at this frame;
- GamePaused – game paused / resumed.

UiManager

This script is responsible for GUI displaying and for all player interactions, such as pointer click. It coordinates transitions to:

- Pause menu
- Victory menu
- Defeat menu
- Quit to main menu

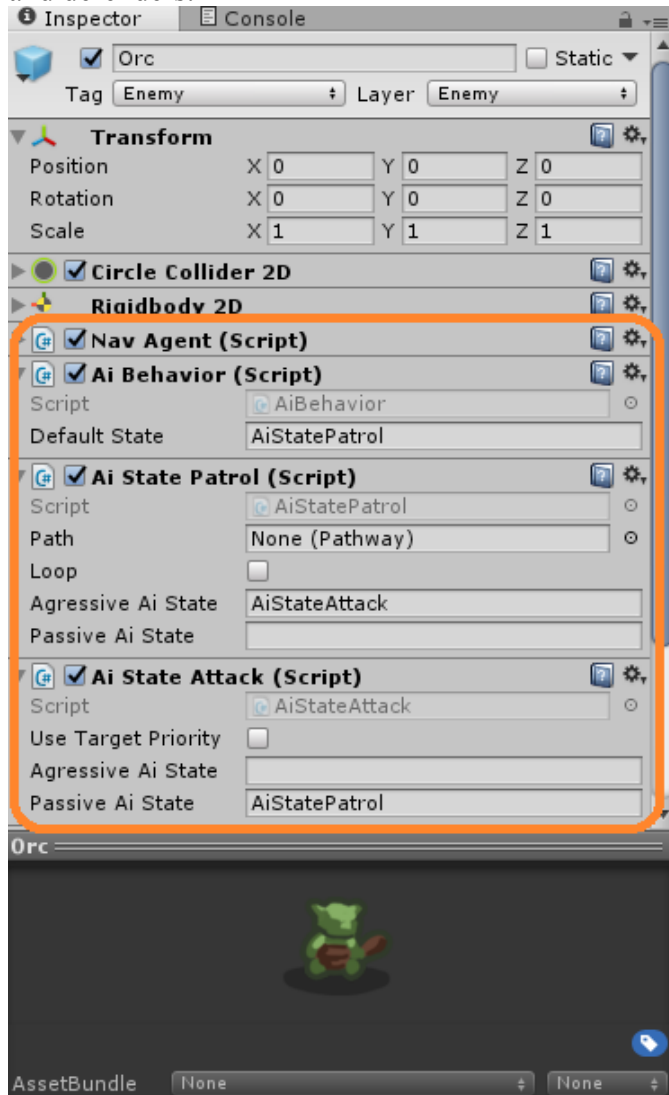
Also UiManager monitors gold amount for towers construction.

LevelManager

Controls level progress and conditions, such as defeat conditions and victory conditions.

AI

There is combination of scripts that helps to organize Artificial Intelligence for all units in game: towers, enemies and defenders.



AiBehavior

This is mandatory script for AI operation. It controls AI states switching and provides one active state at the moment. AI Behavior must have default AI State that is activated on game start.

NavAgent

This script operates movement and turning in 2D space, based on destination controlled by other scripts.

AI States

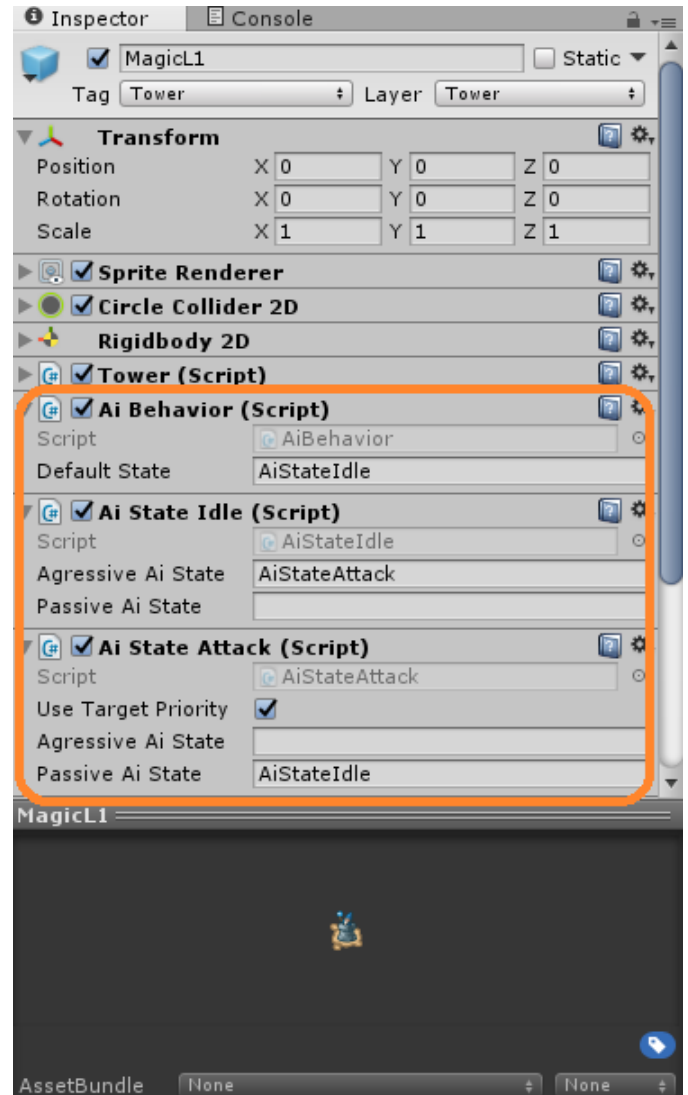
The combination of AI States determines behavior of unit. Each state is individual component added to GameObject. Switching between states is determined by states themselves. For your comfort every state component has two variables “aggressiveState” and “passiveState” which help to organize different behavior of same AI State in several GameObjects (for example: switching from Idle to Attack or switching from Idle to Patrol).

AiStateIdle

The simplest AI State. Unit does not perform any actions, waiting for some events.

AiStateMove

This state is used for moving defenders after spawning. Unit moves to destination (defend point) and then go to passiveState.



AiStatePatrol

This state requires specified Pathway on scene. Unit moves along pathway from one Waypoint to another.

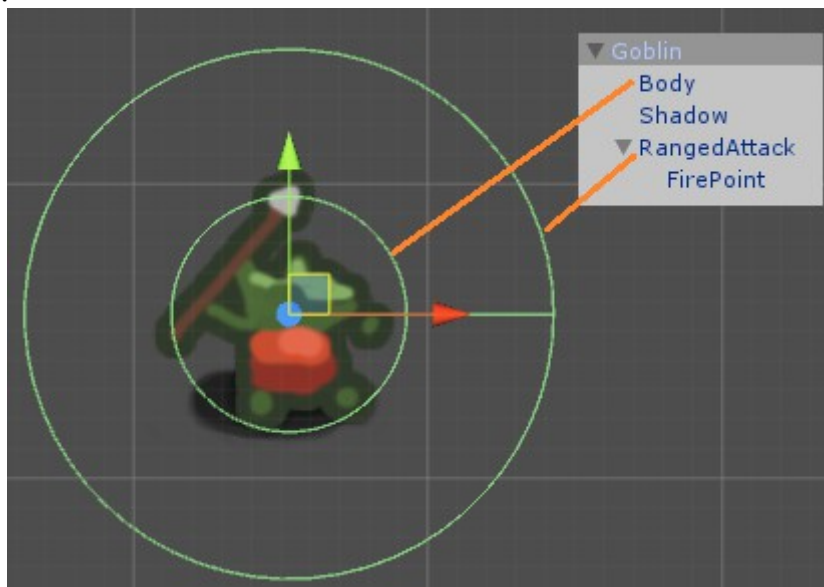
AiStateSpawn

This state is used by Barracks Tower for defenders spawning. It requires defender prefab, specified spawning cooldown and defenders maximum number (at one moment on scene).

AiStateAttack

This state allows unit to attack other GameObjects. Attack state operates two attack types: melee attack and ranged attack. GameObject must have at least one attack type (ore both types). Attack types are attached components with IAttack compatibility (AttackMelee, AttackRanged).

Targets that can be attacked (collide) are specified by one more script AiColliderTrigger. This component has a list of variables that determines allowed targets tags (for example: there can be different targets specified for melee attack and ranged attack).



Towers

Towers are static units that are interactive for player. They can be built and upgraded.



BuildingPlace

Empty script is used to organize parent GameObject for tower building place.

BuildingTree

Building tree opens when player click on tower. It consist of possibilities for tower upgrades.

DefendPoint

Every building place must have defend point. It is used for Barracks when defenders are spawned. Every defend point may have positions for several defenders.

Pathway

This is a set of GameObjects which organize enemies waves.

Pathway

The parent GameObject, includes spawn point and way points.

SpawnPoint

This is an enemies waves generator for current pathway. Enemy waves have settings for waves number, delay before every wave, enemies counter and enemies prefabs. If enemy prefab not set the random enemy will be generated from specified resource folder.

Waypoint

Local part of pathway. The first child Waypoint is the start of pathway.

CapturePoint

This is defeat condition. If enemy reached this point – game will end.

Bullets

All ranged attacks have bullets prefabs. IBullet components control bullet fly.

BulletArrow

Allows to move bullet along ballistic trajectory;

BulletBold

It is identical BulletArrow, but bold can fly through targets.

AOE

Area of Effect damage. May be attached to any bullet. On destroy bullet will cause damage to nearest targets.

Other scripts

DamageTaker

This component's owner can receive damage and die.

Price

This simple script with one variable “price”. It is used for towers building and also for gold increment on unit die.

SpriteSorting

This script controls unit position on screen and sets sprite sorting order depending on Y position. Units with larger Y position will be overlapped by other units.

CameraControl

This script resizes camera on screen resolution change.

MainMenu

It is used in Main Menu scene to control new game start and application exit.