

Game Engines

A look at some common game engines

Game Development Foundations

Last modified 22/10/15 by Sam Cartwright

Contents

- What is a Game Engine
- Why Use a Game Engine
- Common Game Engines
 - 2D Engines and 3D Engines
- Choosing an Engine

What is a Game Engine

- A collection of systems and tools that communicate together as a whole
- Supports content creation
- A game engine might include:
 - A rendering (drawing) engine (aka renderer)
 - A level editor
 - A physics engine
 - An audio system
 - A scripting engine
 - Animation, AI, networking, streaming, memory management, and other components

What is a Game Engine

- It could be described as all the ***non game-specific technology*** needed to make the game run
 - Drawing to the screen, communicating over the network, simulating physics, reading and writing files
- The game itself could be considered the ***game-specific content***
 - 3D models, animation, sound, videos, etc.
 - Game specific code or scripts (player controls, enemy AI, etc.)
 - All of these are called ***assets***

Why Use a Game Engine

- Modern game engines take a *long* time to build
 - All that effort could be used to make your games!
- ‘Off-the-shelf’ game engines give you a quick head-start
 - Start building the content of your game immediately
- All major engines have a large community of users that can help find solutions to development problems
- Benefit from the constant evolution of game engines
 - All major engines regularly add new features, fix bugs, and add support for new platforms and devices

What Game Engines Are Available?

- There are two main categories of game engine:
 - 2D Engines, and
 - 3D Engines
- Some game engines can make both 2D and 3D games
- A 3D engine is substantially more complicated (both to use and make) than a 2D engine
- Let's look at some commonly used game engines (there are many, many more than shown here)

Adventure Game Studio

- Specifically for making 2D point-and-click adventure games
- **2D/3D Oriented:** 2D
- **Platforms:** Windows, Linux
- **Scripting Language:** Custom
- **Price:** Free

<http://www.adventuregamestudio.co.uk/>



Construct 2

- Lots of platforms supported.
Can make games without writing code.
- **2D/3D Oriented:** 2D
- **Platforms:** Web, Wii U, iOS, Android, Windows, Win Phone, Mac, Linux, Blackberry, Firefox, Tizen, Facebook, Chrome, Amazon
- **Scripting Language:** None (custom event system)
- **Price:** From around \$150, free trial available

<https://www.scirra.com/>



Game Maker

- Designed for easy, fast development of cross-platform games
- **2D/3D Oriented:** 2D
- **Platforms:** Web, iOS, Android, Windows, Win Phone, Mac, Linux, Play Station, XBOX, Tizen
- **Scripting Language:** Custom
- **Price:** Basic version Free, depending on release platform up to \$800

<https://www.yoyogames.com/>



CryEngine 3

- First used in Far Cry and Crysis. Extensive toolkits for world building and game content creation
- **2D/3D Oriented:** 3D
- **Platforms:** Windows, Play Station, XBOX, Wii U, Android, iOS
- **Languages:** C++, Lua, Visual Scripting
- **Price:** Free or Paid (Pro)

<http://cryengine.com/>



Source Engine

- Used to make Half Like 2. The Source Engine comes bundled with any Source-based game
- **2D/3D Oriented:** 3D
- **Platforms:** Windows, Play Station, XBOX, Linux, Mac
- **Languages:** C++
- **Price:** Free or Paid

https://developer.valvesoftware.com/wiki/Main_Page



Unreal Engine 4

- A Complete suite of development tools to support everything from 2D mobile games to console blockbusters
- **2D/3D Oriented:** 2D and 3D
- **Platforms:** Windows, Web, Play Station, XBOX, Mac, Linux, Android, iOS
- **Languages:** C++, Visual Scripting
- **Price:** Free (5% royalty)

<http://cryengine.com/>



Choosing a Game Engine

- Your choice of game engine will depend on:
 - Type of game / technology needed
 - Target platforms
 - Skill level of your team
 - Cost
 - Popularity of the engine (longevity / support)

Summary

- Game engines provide an integrated environment to support game development
- You write the game code and supply the assets, the game engine takes care of the rest
- There are many engines available for 2D and 3D game development
- There are many factors to consider when choosing an engine

References

- Wikipedia. 2015. *List of game engines*. [ONLINE] Available at: https://en.wikipedia.org/wiki/List_of_game_engines. [Accessed 08 December 2015].
- GameCareerGuide.com. 2015. *What is a Game Engine?* [ONLINE] Available at: http://www.gamecareerguide.com/features/529/what_is_a_game.php. [Accessed 08 December 2015].