

Computer Animation and Games I

CM50244

What a Game Is?

...

Overview

- Basic Elements of Computer Games
 - graphics, music, etc.
- Game Software System
- Game Programming
 - API-based programming
 - Engine-based programming

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Graphics

- Realistic and real-time rendering
- Visual feedback
- High quality display



Music and Sound

- Game music
- Sound FX
 - Exploding
 - Wind blowing
 - Raining
 - Walking



Input

- Mouse
- Keyboard
- Gamepad
- ...



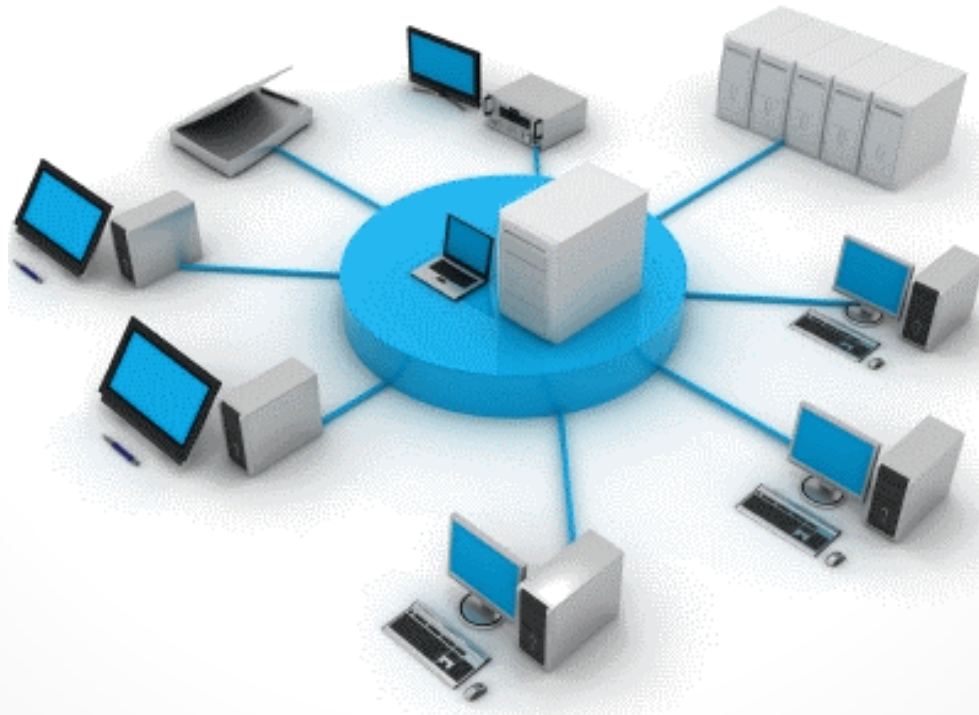
Game Logic

- Artificial Intelligence(AI)
 - NPC (Non-player character) system
- Physics
 - Collision
 - Gravity
- Resource Management
 - Texture
 - Model
 - Music

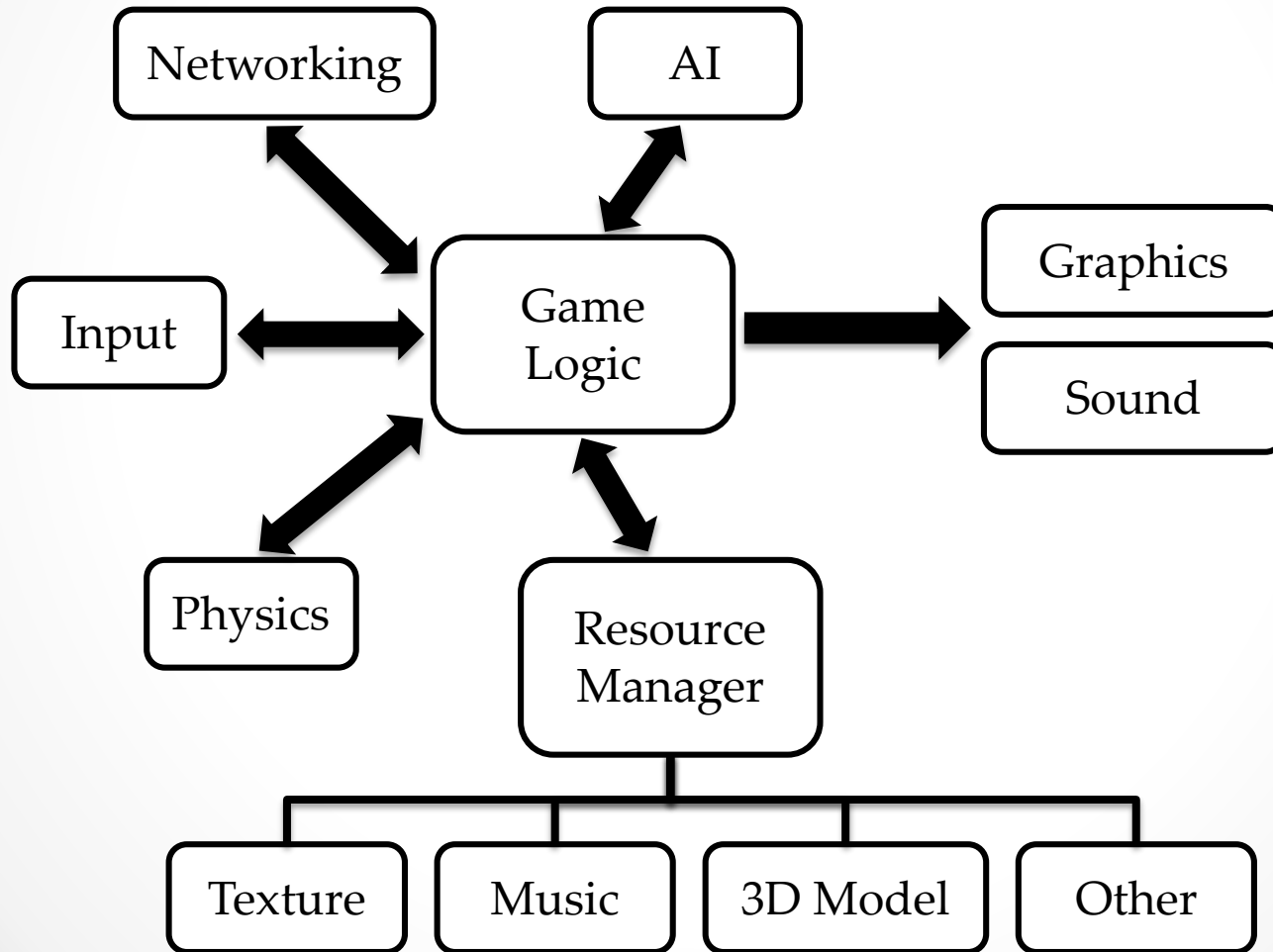


Networking

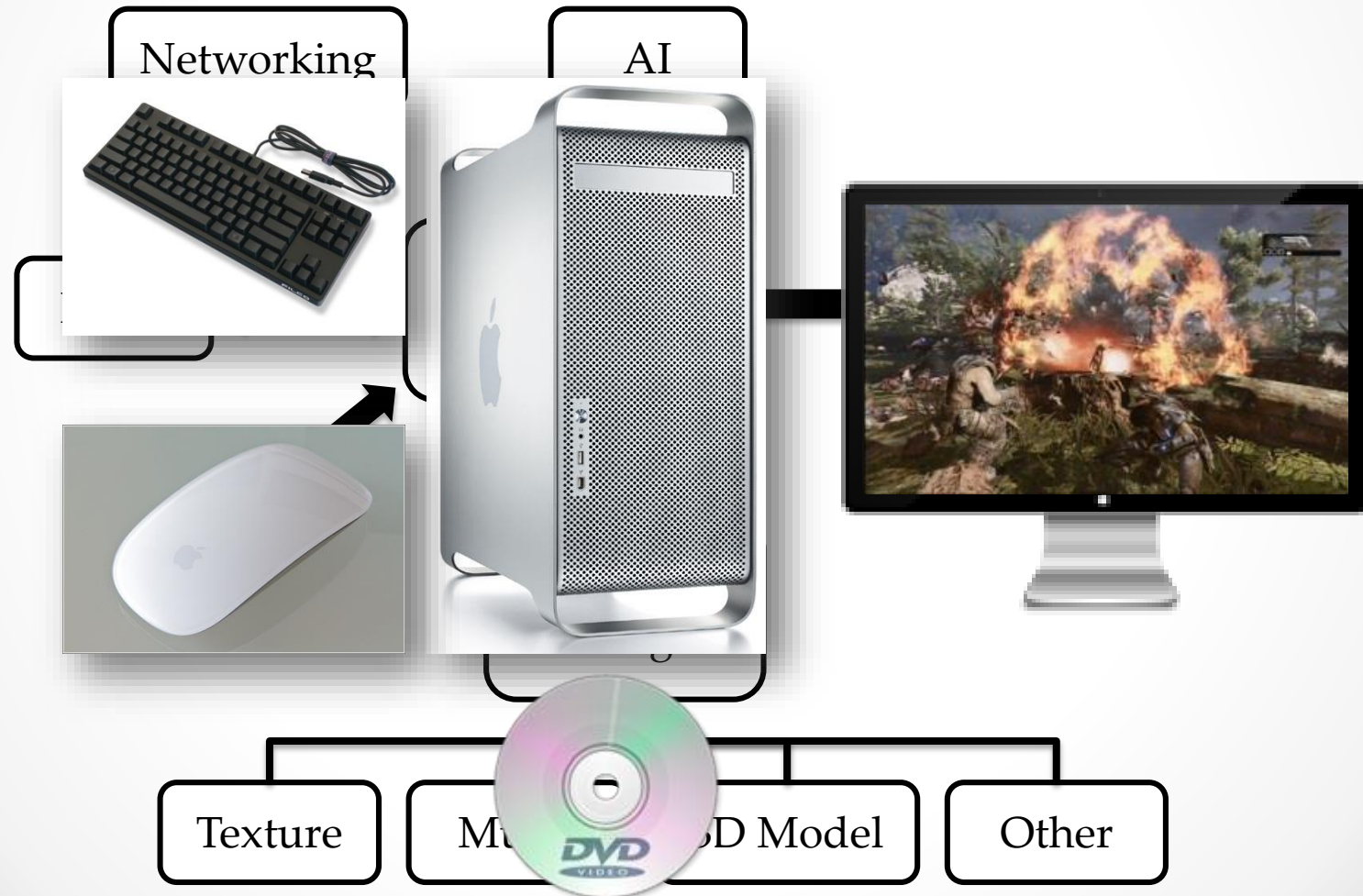
- Message packing
- Data transferring / receiving
- Encryption / Decryption



Game Architecture



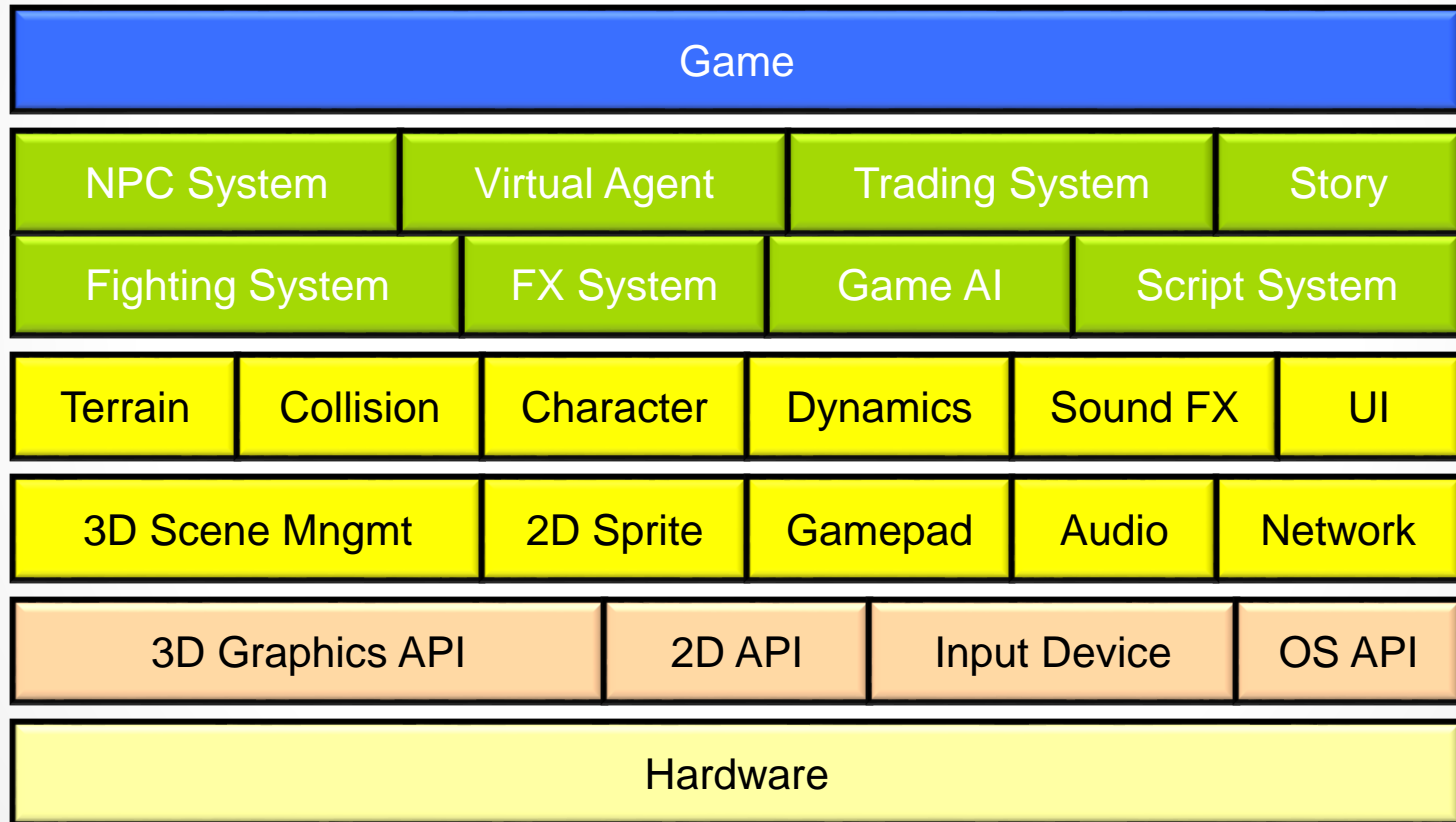
Game Architecture



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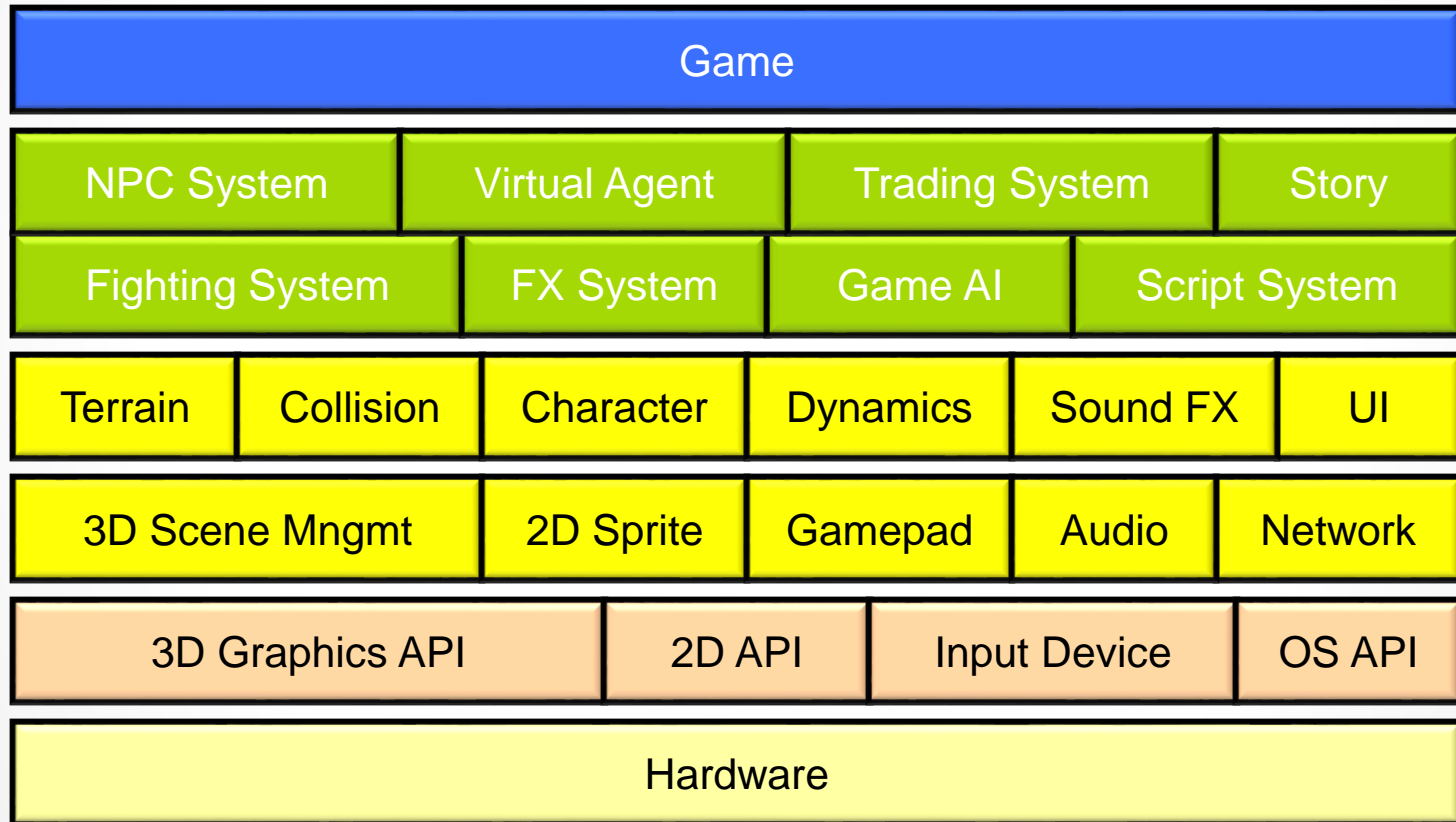
Game Software System



Overview

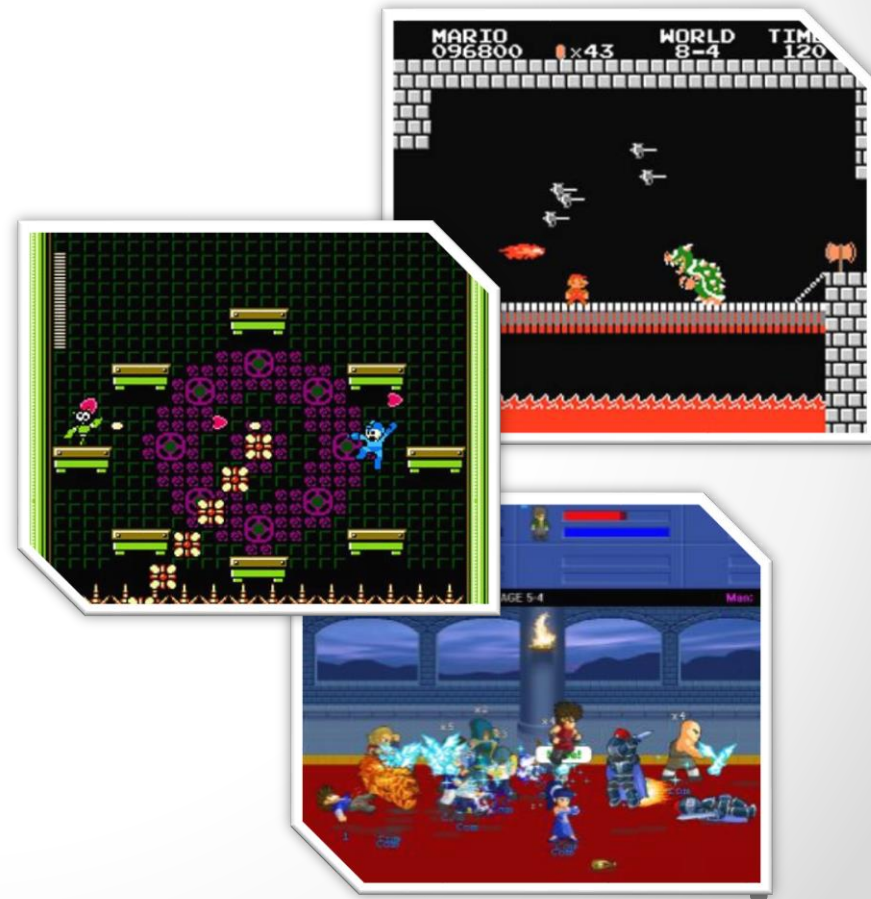
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API-based Programming



Low level APIs

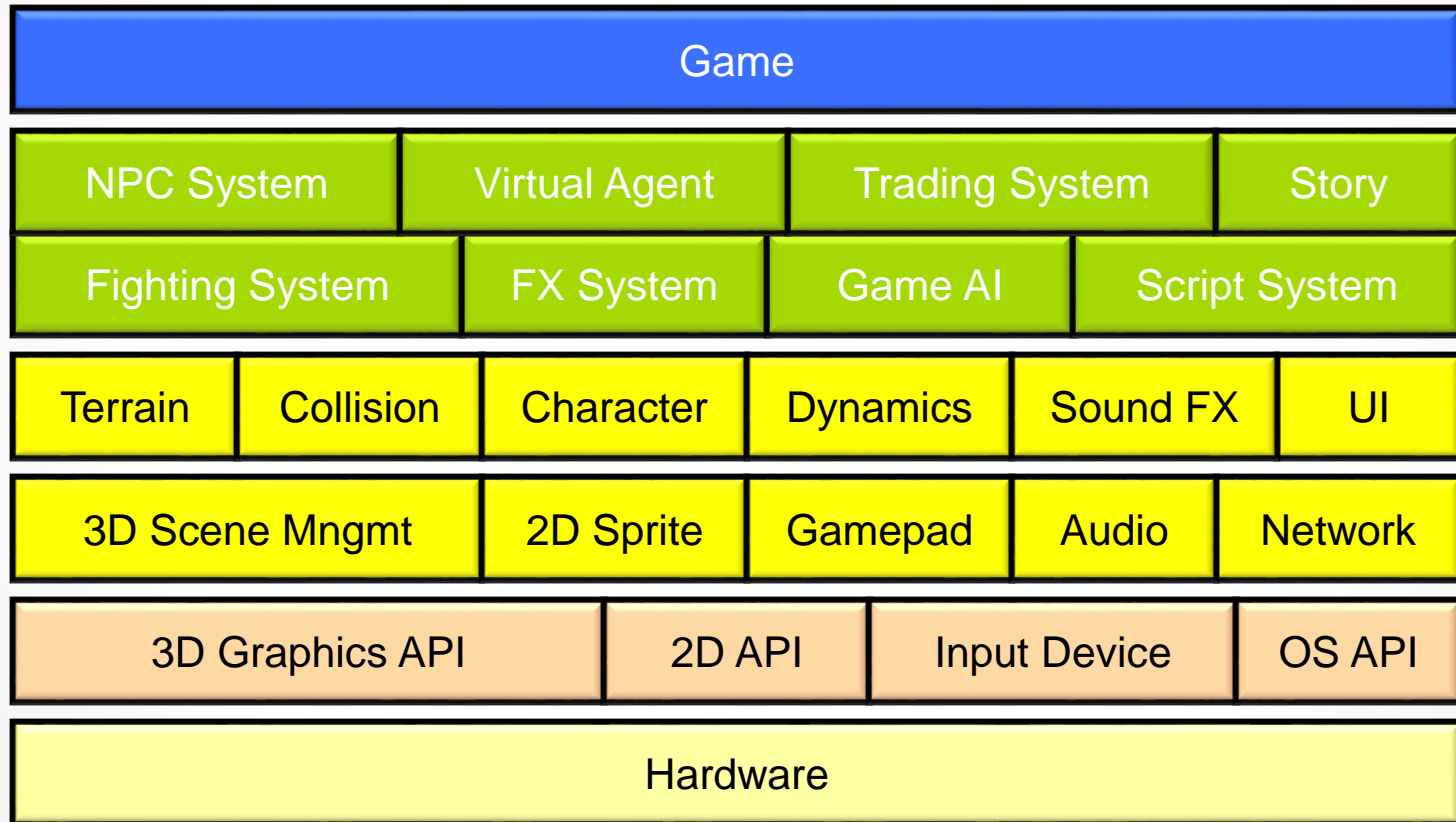
- API (Application Programming Interface)
- Graphics APIs:
 - OpenGL
 - Direct3D
- OS APIs:
 - Win API
 - glut (Win API + OpenGL)
- Audio APIs:
 - OpenAL
 - DirectSound



Pros and Cons

- Pros
 - Good performance with optimized code
- Cons
 - Massive coding work
 - Terrible reusability
 - Platform-dependency
 - Hard to create a “complex” game

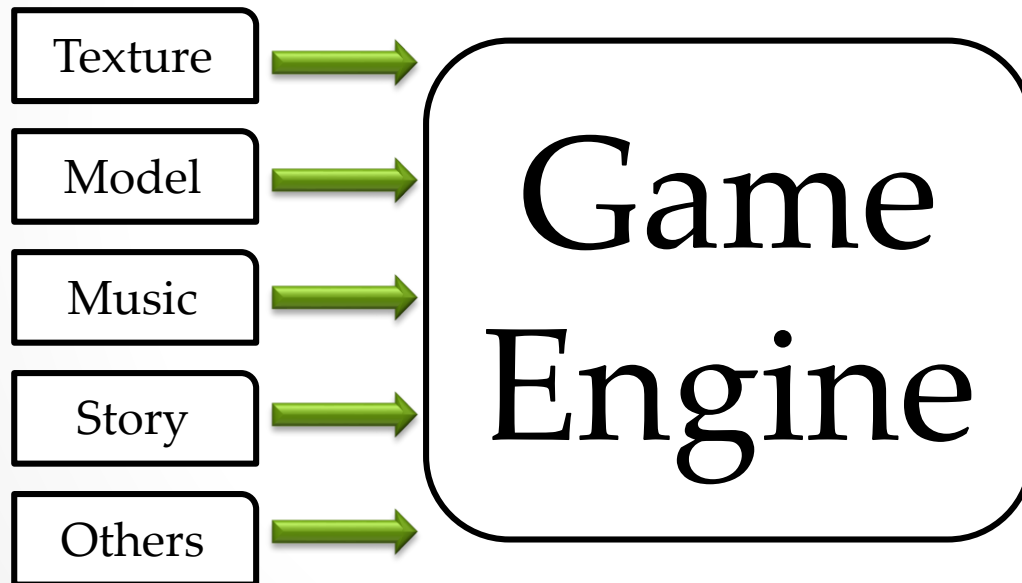
Engine-based programming



Game Engines Awesome!

User

Game!



Pros and Cons

- Pros
 - No(minor) programming
 - Stability
 - Scalability
 - Reusability
 - Platform-independency
 - High-performance
- Cons
 - A long term process to establish and evaluate

Animation in Film vs. in Game

- A lot of graphics techniques in common
 - modeling, rendering, animation
- Game is interactive!
 - requires real-time performance
 - the rendering doesn't need to be perfect, but needs to be good at least
 - needs AI to control non-player character