



Information Coding / Computer Graphics, ISY, LITH

Graphics engines and their APIs

Code packages with a well-defined interface

2D or 3D

2D: Usually pixel-graded coordinates

3D: Normalized coordinates, world-graded coordinated,
scalable



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Features in a 2D API

Commercial 2D API's:

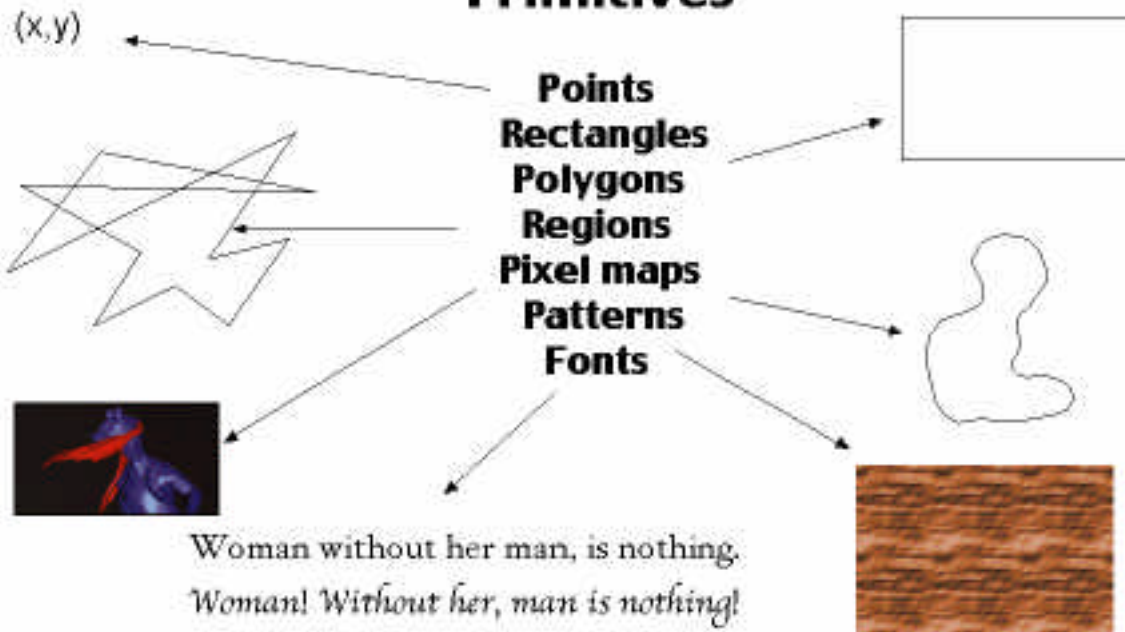
GDI (Graphics Device Interface)
(Microsoft, MS Windows)

QuickDraw
(Apple, MacOS)

CG
(Apple, MacOSX)



Primitives



2D versus 3D

2D: Points, lines, text

3D: Polygons, surfaces, camera

2D has more different primitives

3D builds everything from polygons



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3D APIs

**OpenGL (Mesa, OpenGL ES)
Direct3D
Java3D
and many others**



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OpenGL

Portability: Excellent!

Performance: Good

Hardware acceleration: Yes

Source: Yes (Mesa)

Language: Any

Low-level



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Direct3D

Portability: Poor

Performance: Good

Hardware acceleration: Yes

Source: No

Language: Any (C++)



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Java3D

Portability: Good!

Performance: Fair

Hardware acceleration: Yes

Language: Java only

High-level



API \neq library

APIs can be mapped onto each other for compatibility.

A poor library can have a good API and vice versa.



OpenGL/OpenGL ES for games?

**Playstation 3
GameCube
Wii
iPhone**

plus Linux, MS Windows, MacOSX

Everywhere - except Xbox.



Libraries on top of OpenGL/DirectX

Game engines, middleware

Higher-level APIs

Many game engines support both DirectX and OpenGL.



Next lecture

2D graphics

2D transformations - and why

Introduction to OpenGL

How to do the same 2D operations in OpenGL