

# Overview of AR Applications

Tue, June 30 (Week 2)

# The Loop of Every Interactive 3D Software

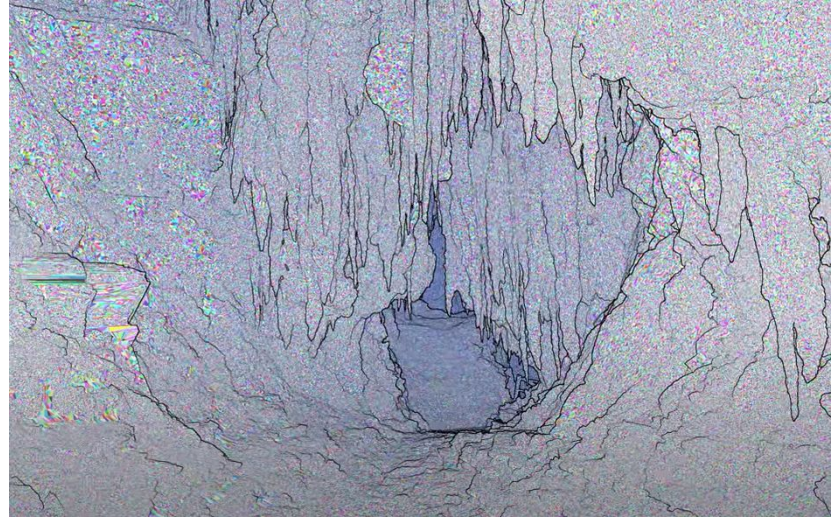
Loop per Frame:

Input -> CPU -> GPU -> Monitor

Inputs:

Keyboard/Mouse/Touch/Trackers/Controllers/Cameras

Between Every Frame... ( $< 1/30$  seconds)



# The Structure of a 3D Software

1. Collect the input and interpret it.

- : Tracking and Camera Detection

2. Update the virtual world inside.

- : The Application-specific Logic

3. Render the virtual world.

- : Meshes, Textures, and Lights

# The Structure of a 3D Software

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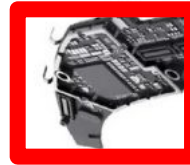
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**HoloLens MLB**  
**(Main Logic Board)**

- Windows 10
- Custom-built Microsoft Holographic Processing Unit (HPU 1.0)
- 64GB Flash
- 2GB RAM (1GB CPU and 1GB HPU)
- x86 architecture

# CPUs/GPUs



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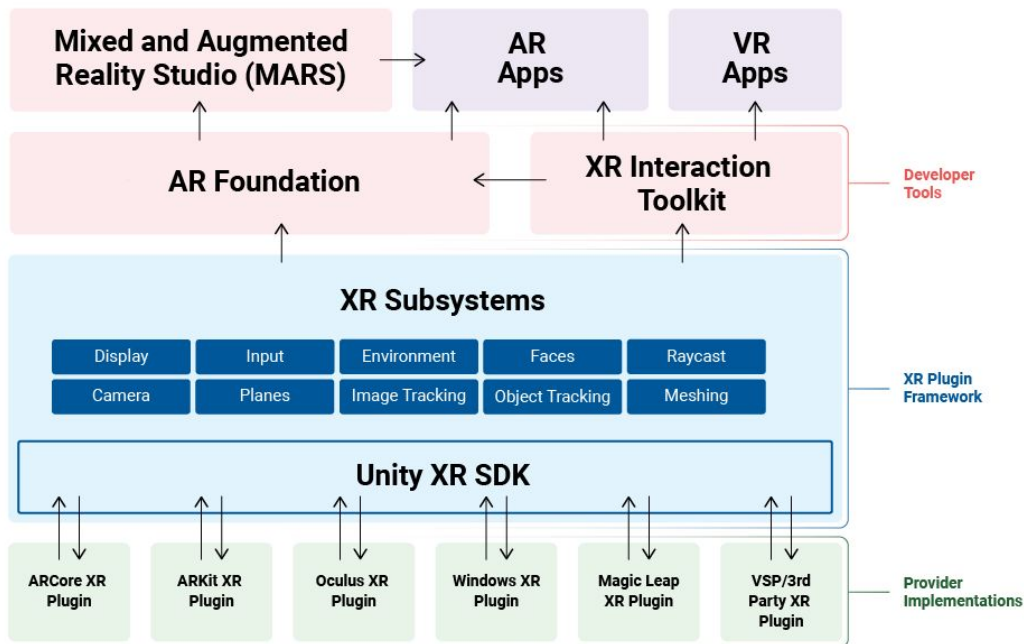
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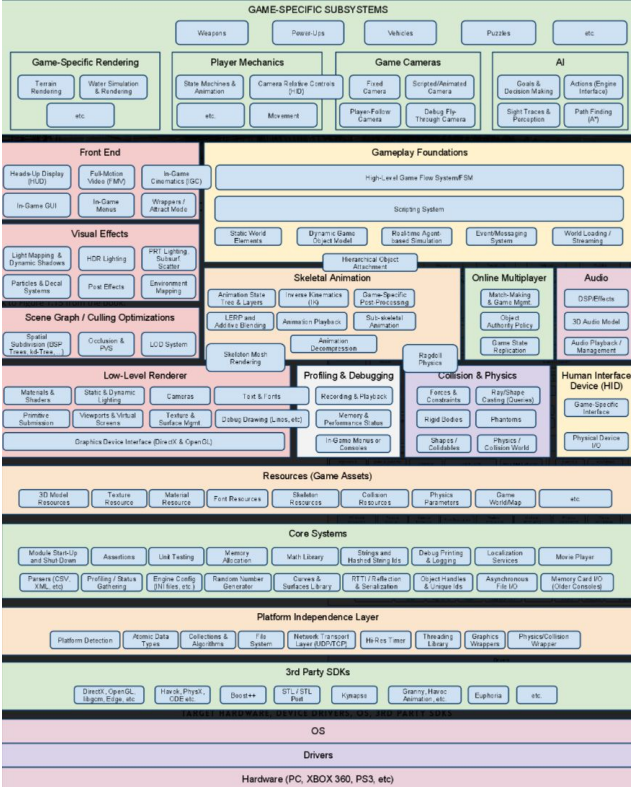
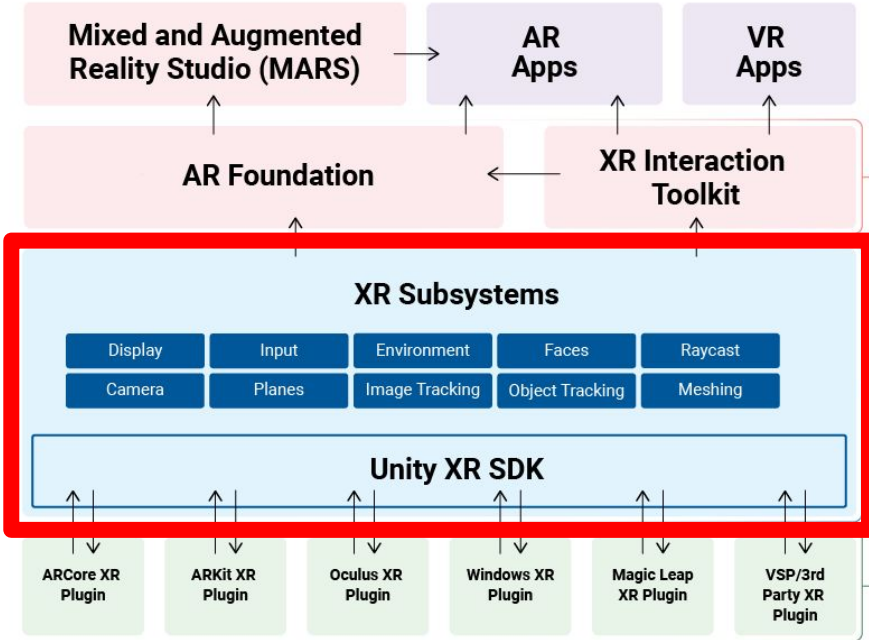
# Game Engine

## Unity XR Tech Stack



# Game Engine

## Unity XR Tech Stack



# Trade-off Cost of Relying on Pre-existing Code

1. Collect the input and interpret it.

: Tracking and Camera Detection



**Small**

2. Update the virtual world inside.

: The Application-specific Logic



**Large**

3. Render the virtual world.

: Meshes, Textures, and Lights



**Small**

# Trade-off Cost of Relying on Pre-existing Code

1. Collect the input and interpret it.

: Tracking and Camera Detection



**Use Engine**

2. Update the virtual world inside.

: The Application-specific Logic



**Write Yourself  
= Application Code**

3. Render the virtual world.

: Meshes, Textures, and Lights



**Use Engine**