

# Using AR in Mobile iOS

Software innovation is a journey.  
We can guide you.

Victor Utrilla, iOS Engineer.



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# TALK OVERVIEW

1. How ARKit works
2. ARKit in a nutshell
3. Core Features
4. Requirements
5. Hands Dirty with Demos
6. Demo breakdowns



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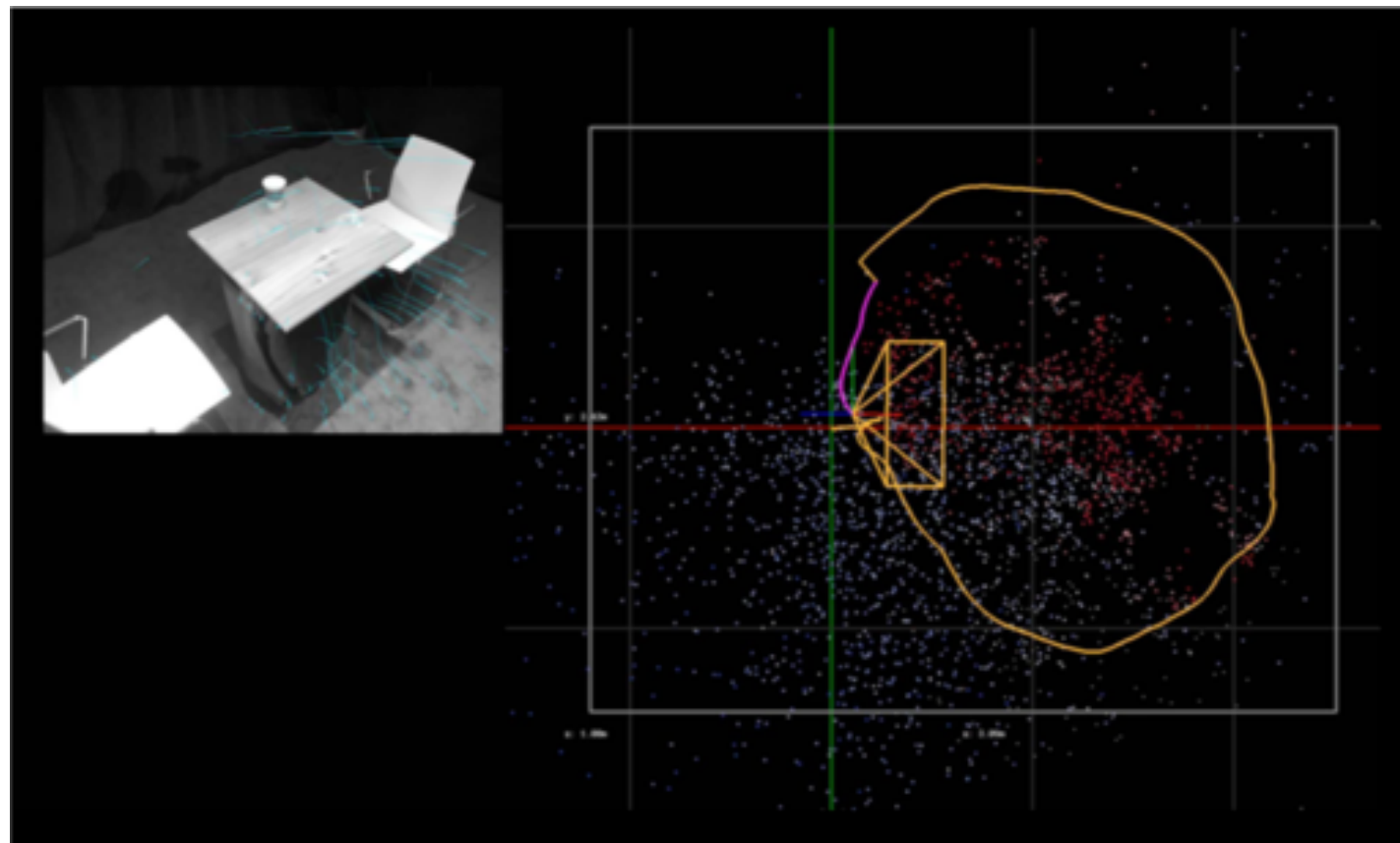
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# HOW DOES IT WORK?

## Visual-inertial odometry

This process combines information from the device's motion sensing hardware with computer vision analysis of the scene visible to the device's camera.



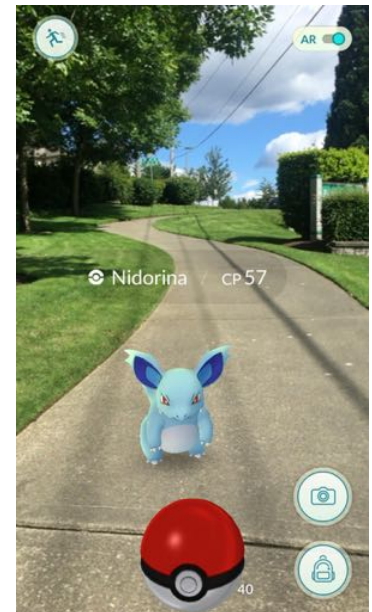
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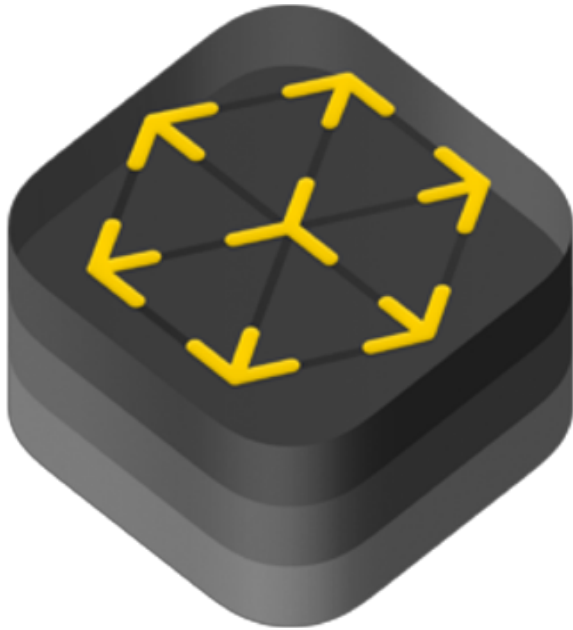
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# LAYERS OF ARKit



Tracking

Scene Understanding

Rendering



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# TRACKING TECHNOLOGIES



Orientation Tracking



World Tracking



Plane Detection



Saving and  
Loading Maps



Image Tracking



Object Detection



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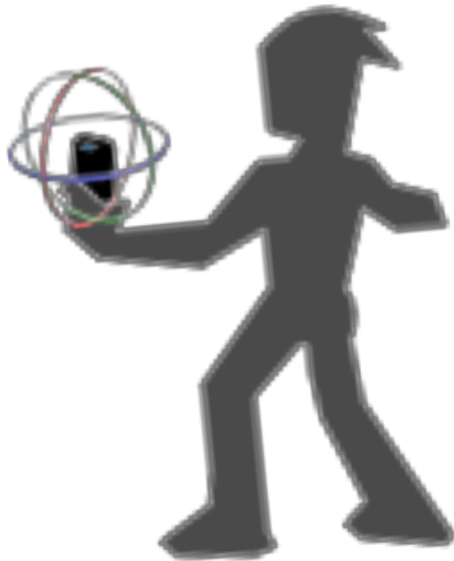
# TRACKING

## Orientation Tracking

Tracks orientation only (3 DoF)

Spherical virtual environments

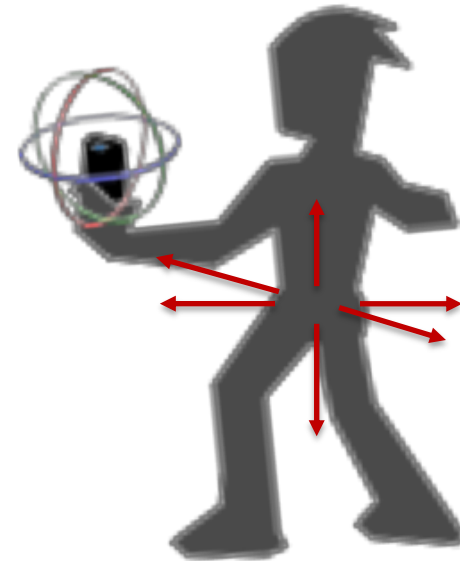
Not suited for physical world augmentation from different views



## Real World Tracking

Tracks camera viewing orientation and change in position (6 DoF)

Look around in the real world like you move in the real world.

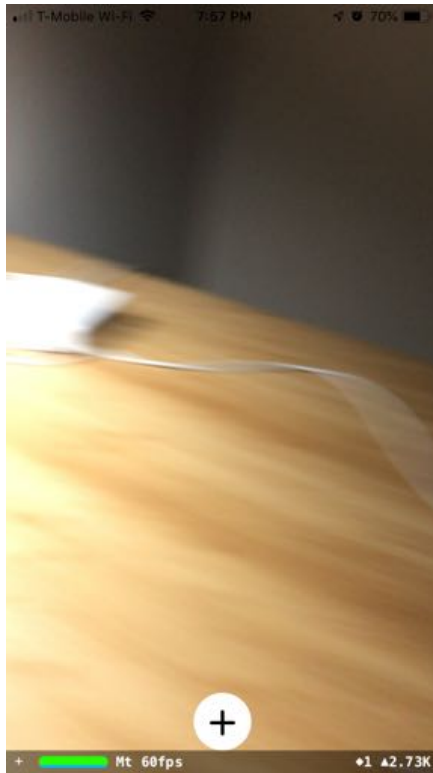


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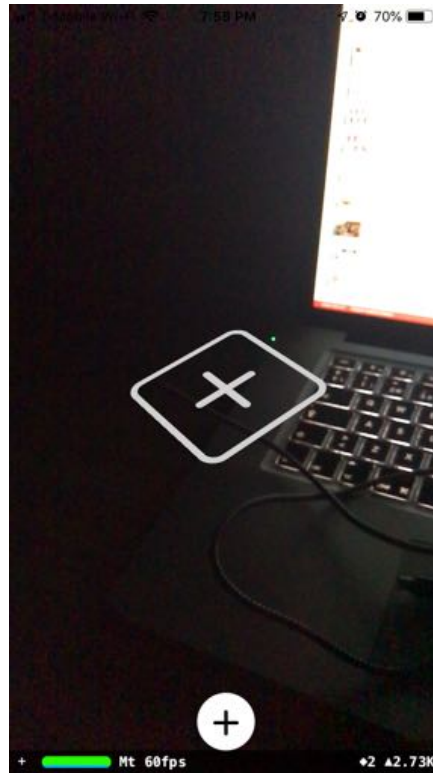


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# WHAT CAUSES TRACKING TO FAIL?



Too much motion



Too little light



Relocating



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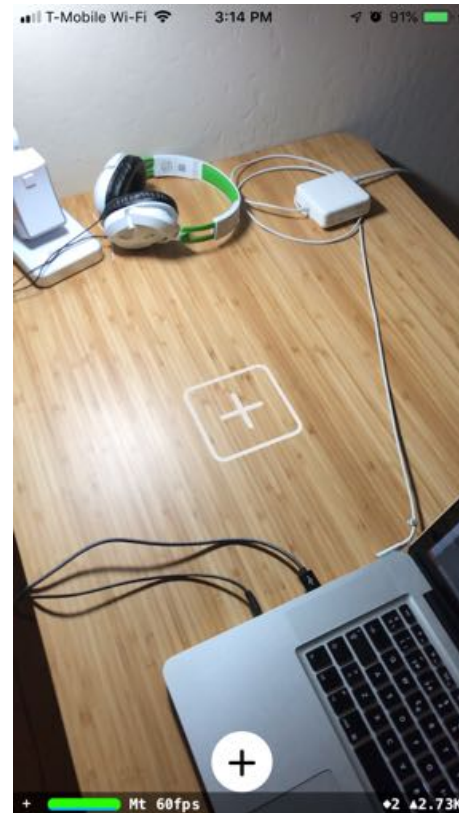


# SCENE UNDERSTANDING

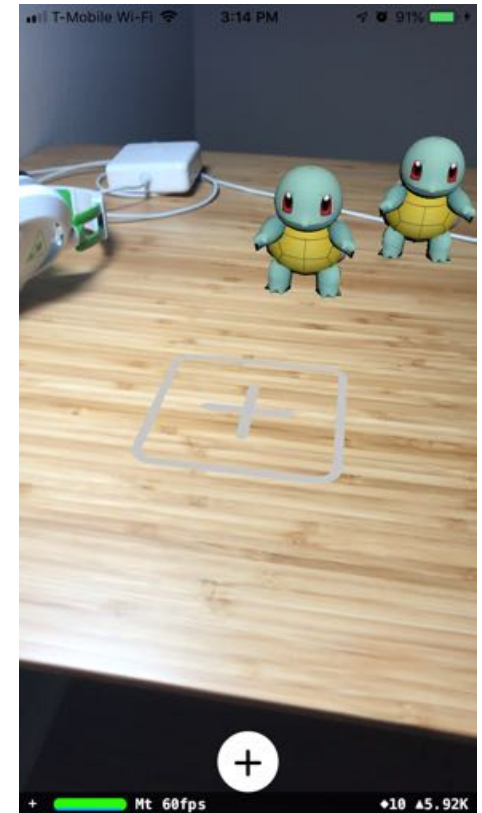
Enables the detection of all the surfaces in the physical world.



Place virtual objects on it.



Provide light estimation simulating a light source in the physical world.



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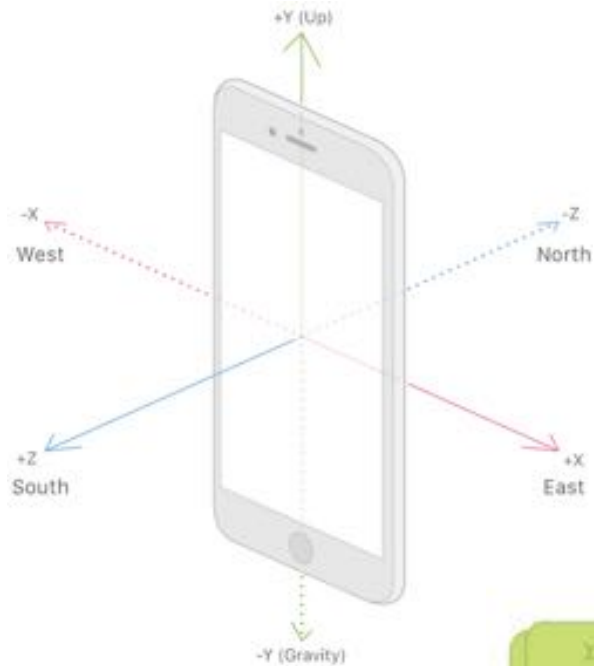
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# 3D COORDINATE SYSTEM



## Orientation

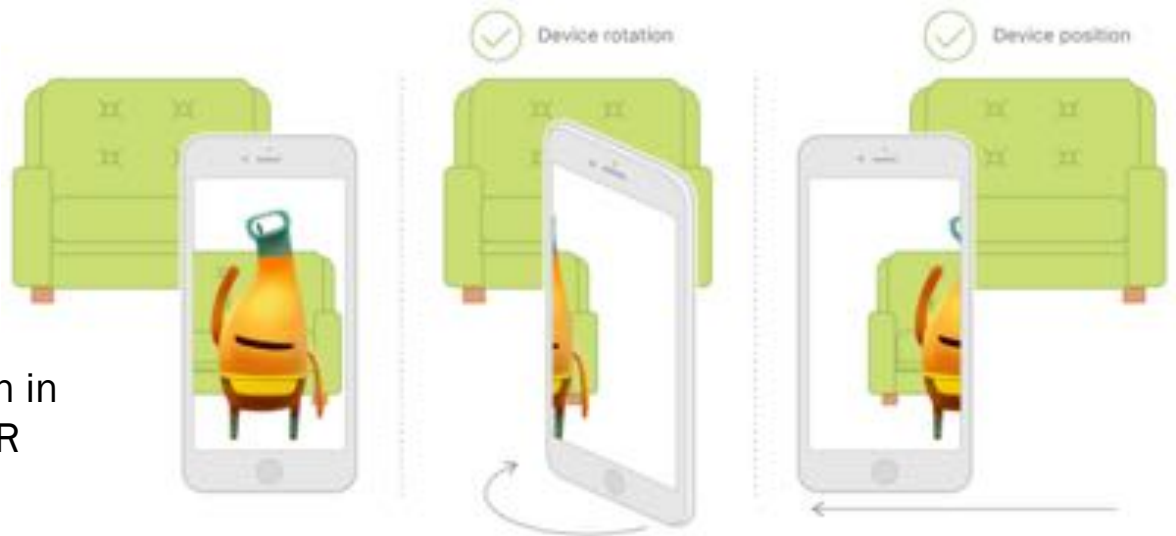
The angles at which something is tilted.

## Position

Position in space relative to the origin.

## Origin

The device's position in space when the AR session begins.



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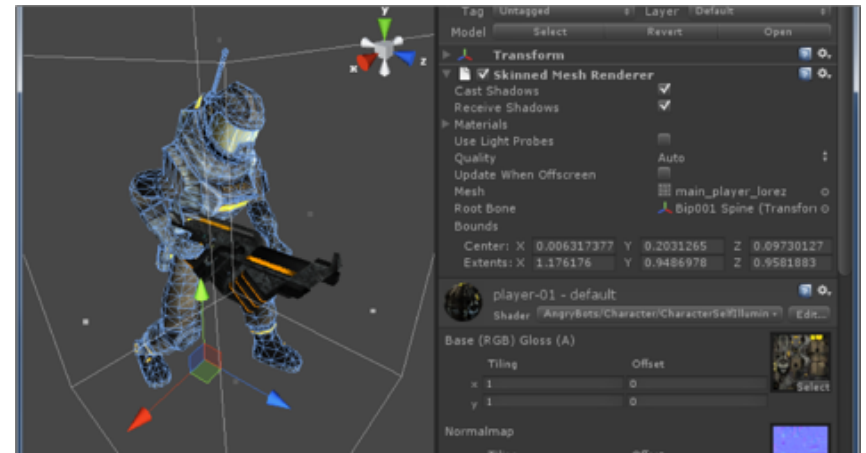


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# RENDERING

Processing of the 3D models and present them in your scene.



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# COMMON FILE FORMATS FOR 3D

**.dae** for Digital Asset Exchange files

**.obj** for Wavefront 3D Object files with material .MTL files

**.3ds** for 3D Studio Scene files by AutoDesk

**.fbx** for FBX files (Filmbox) by AutoDesk

**USDZ** for easy sharing



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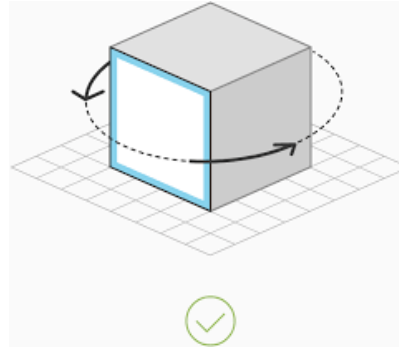
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# ARKit IN A NUTSHELL



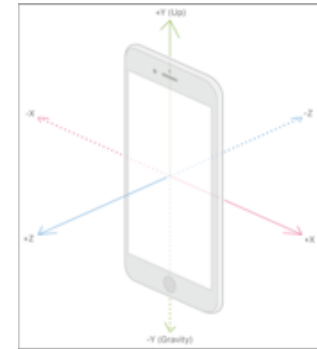
## Real-World

Come from a camera as a backdrop or as an input



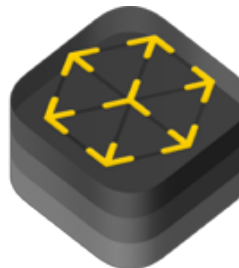
## Virtual Images

These are 2D or 3D objects drawn on top of the Real-World



## Sensor Smarts

Ability to detect position and orientation, as well as objects in the Real-World



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# CORE FEATURES



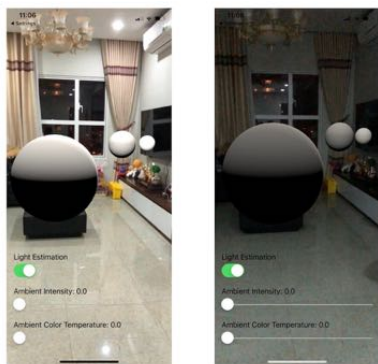
## Plane Finding

Using the sparse point cloud extraction from the SDK's to estimate and create planes.



## Position Tracking

Tracking the device's position as it moves throughout the space.



## Light Estimation

Estimate the current camera views ambient light value to light digital objects with real world light.



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# ARKit REQUIREMENTS



6s/6sPlus  
US



7/7Plus



8/8Plus



iPhoneX



iPhoneXR



iPhoneXS



iPhoneXS  
Max



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iPad 2017 and  
later



10.5-in. iPad Pro



11-in. iPad Pro



12.9-in. iPad Pro



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# MORE REQUIREMENTS



First iOS version that supports ARKit



Xcode 9.3 or later



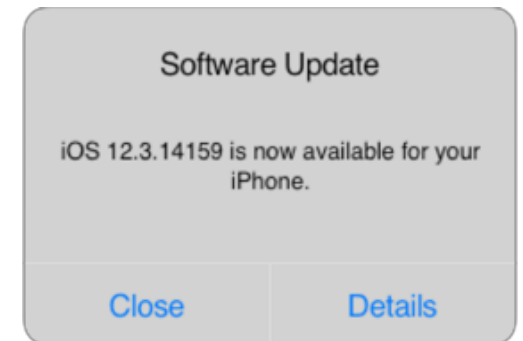
Sprite/Scene Kit basics



Willingness to move around with your Device



Understand a little 3D math



Deal with upgrades



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# IT MAY BE CONVENIENT...

**10ft long cables**

**sit back & relax**



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SHOW ME A DEMO



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# WHAT YOU DIDN'T LEARN

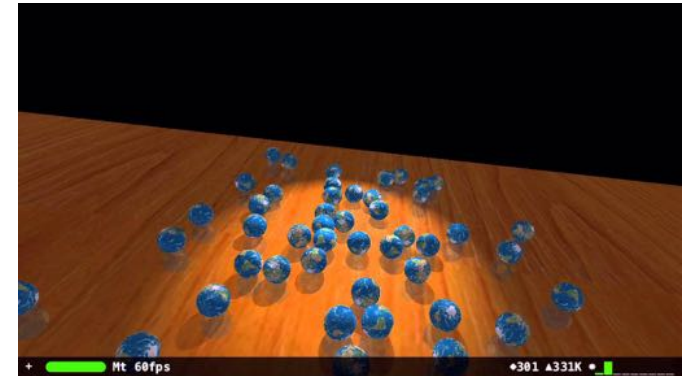
ARKit already offers so much ground to cover that a single workshop can't cover it all...



ARKit with Core  
Location



ARKit Object Tracking



SceneKit Physics

A lot more...



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# WHERE TO GO FROM HERE?



ARKit 2



Apple's ARKit Documentation  
[ARKit](#)

Apple's Human Interface Guidelines  
[Human Interface Guidelines](#)

Awesome ARKit Repo  
[Awesome-ARKit](#)



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