Using AR in Mobile iOS

Software innovation is a journey.
We can guide you.

Victor Utrilla, iOS Engineer.

AvenueCode

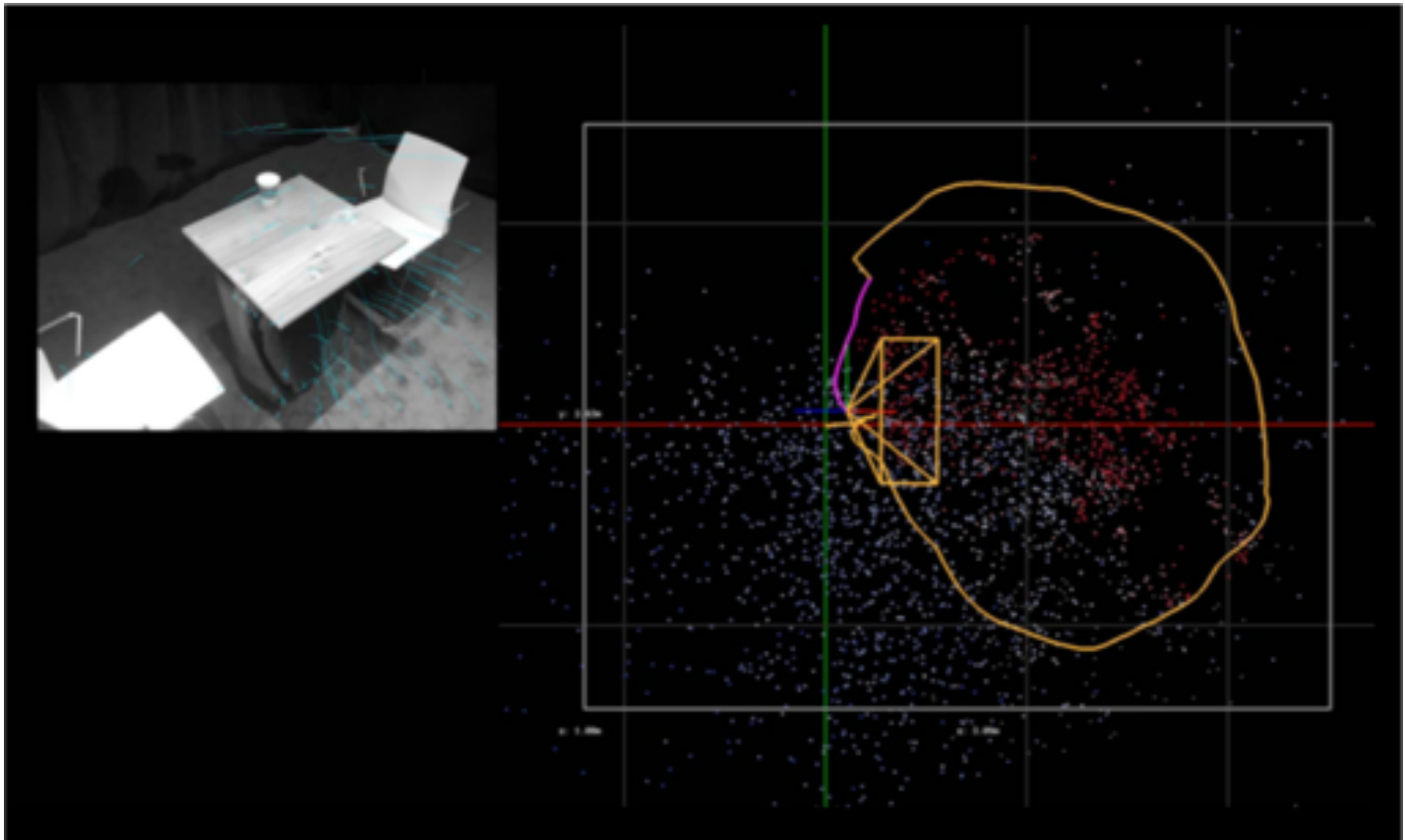
TALK OVERVIEW

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

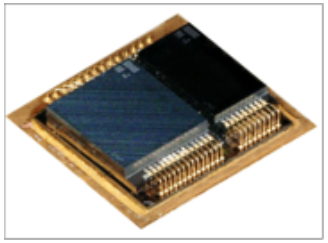
HOW DOES IT WORK?

Visual-inertial odometry

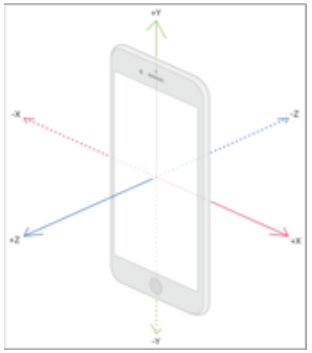
This process combines information from the device's motion sensing hardware with computer vision analysis of the scene visible to the device's camera.



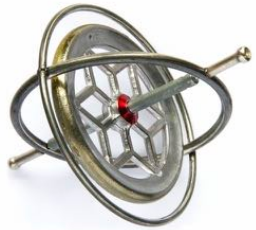
WAIT... WHAT?



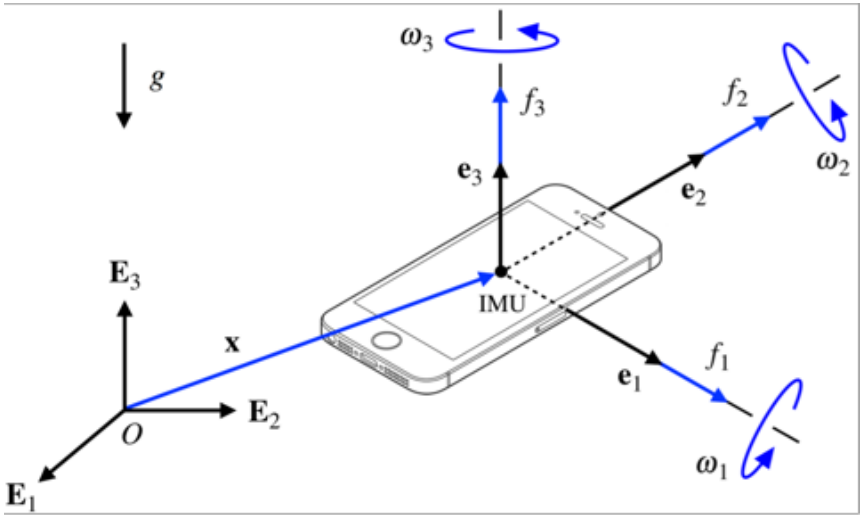
IMU Sensor



Accelerometer



Gyroscope



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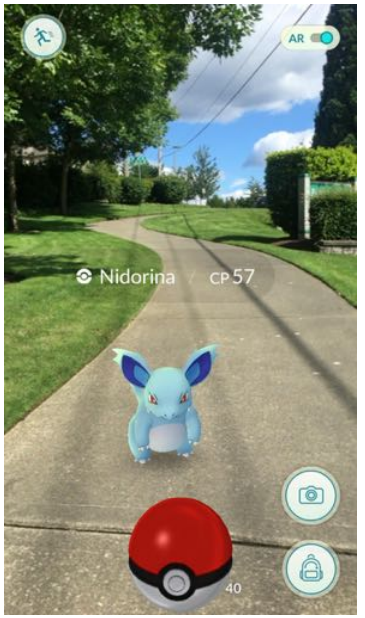
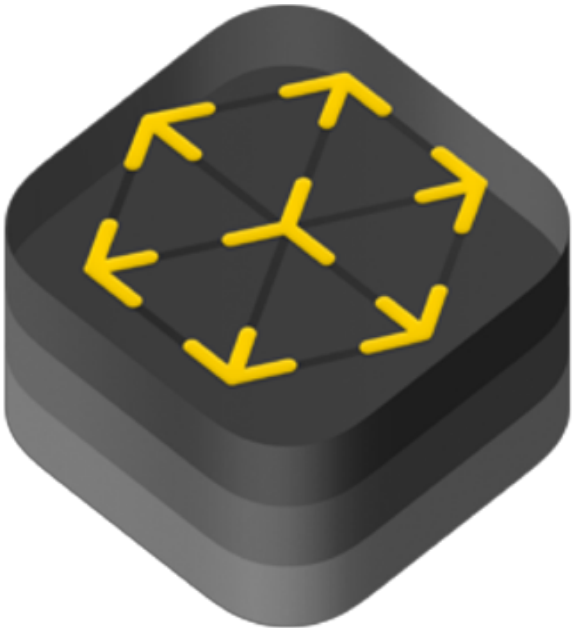


LAYERS OF ARKit



Tracking

Scene Understanding

Rendering

TRACKING TECHNOLOGIES

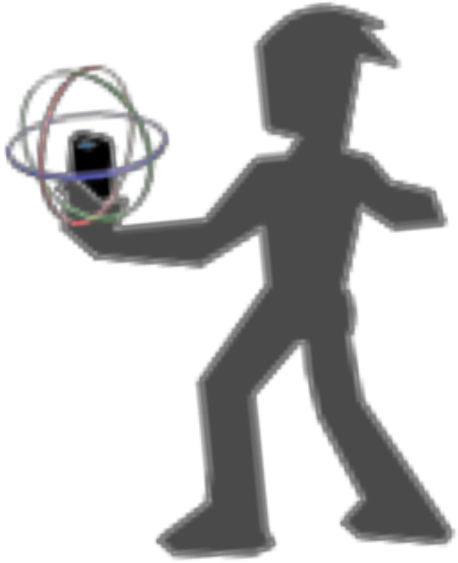
TRACKING

Orientation Tracking

Tracks orientation only (3 DoF)

Spherical virtual environments

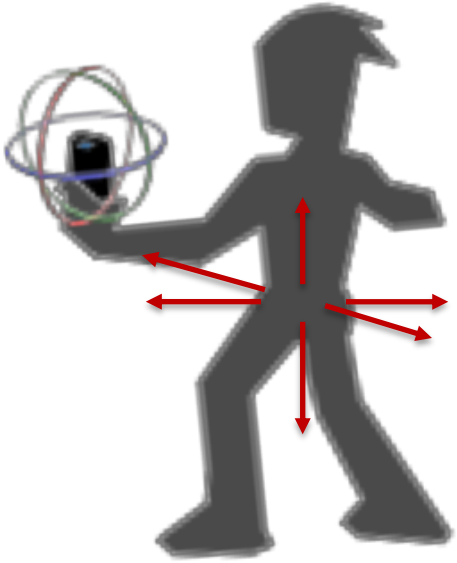
Not suited for physical world augmentation from different views



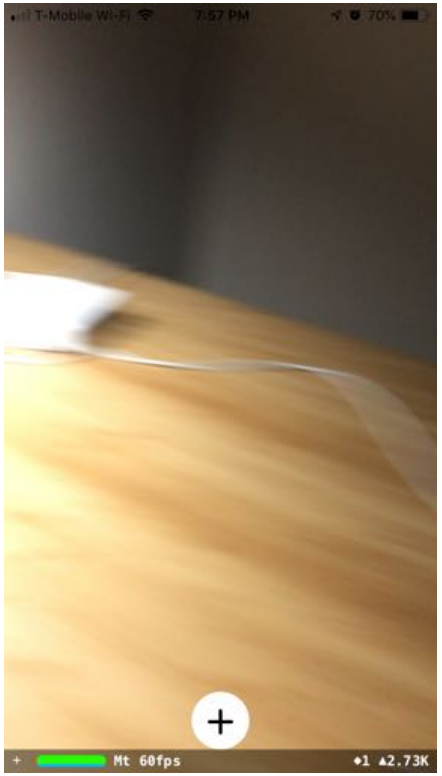
Real World Tracking

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

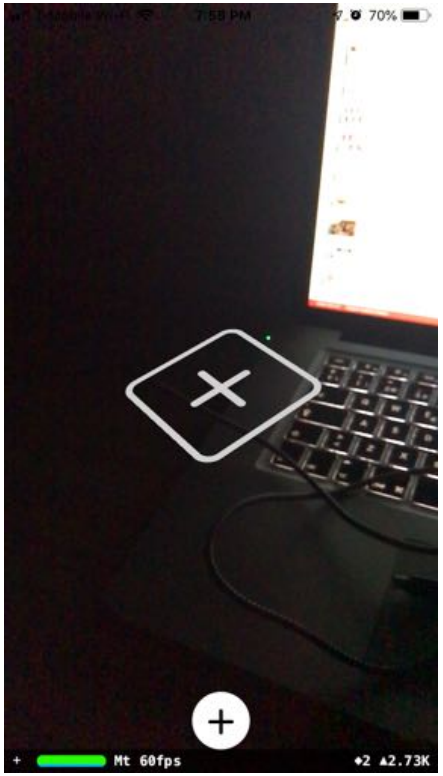
Look around in the real world like you move in the real world.



WHAT CAUSES TRACKING TO FAIL?



Too much motion

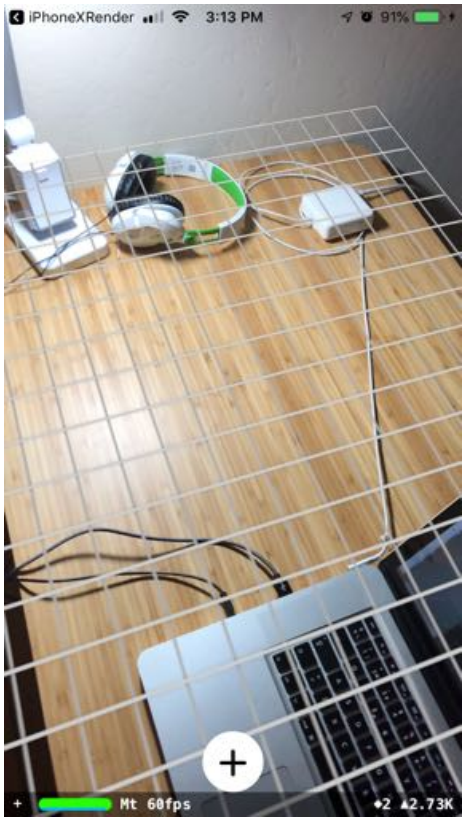


Too little light

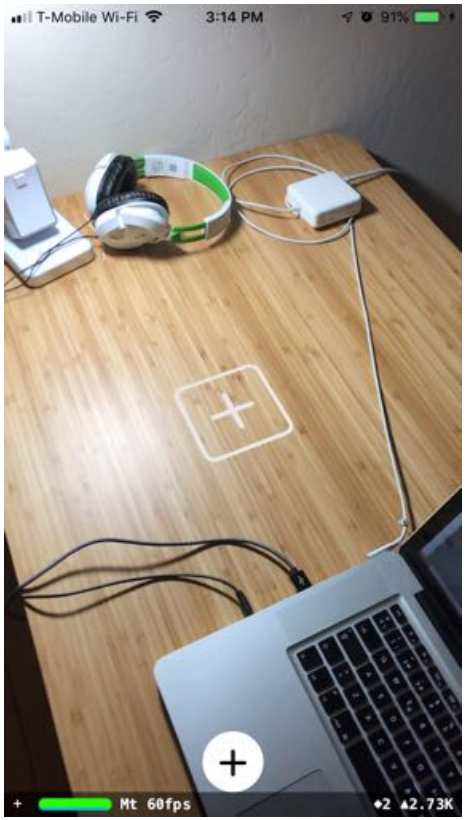
Relocating

SCENE UNDERSTANDING

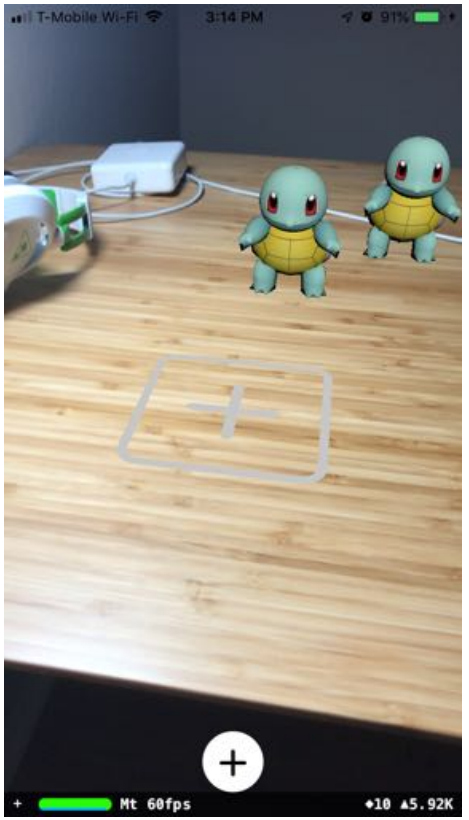
Enables the detection of all the surfaces in the physical world.



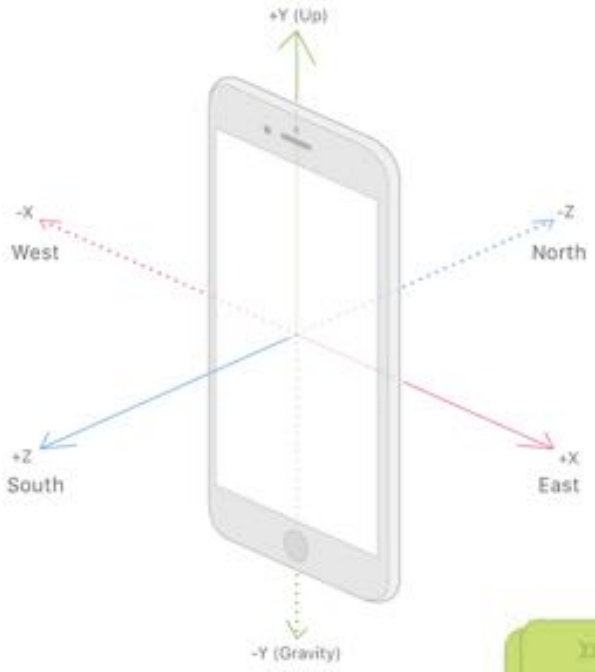
Place virtual objects on it.



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



3D COORDINATE SYSTEM

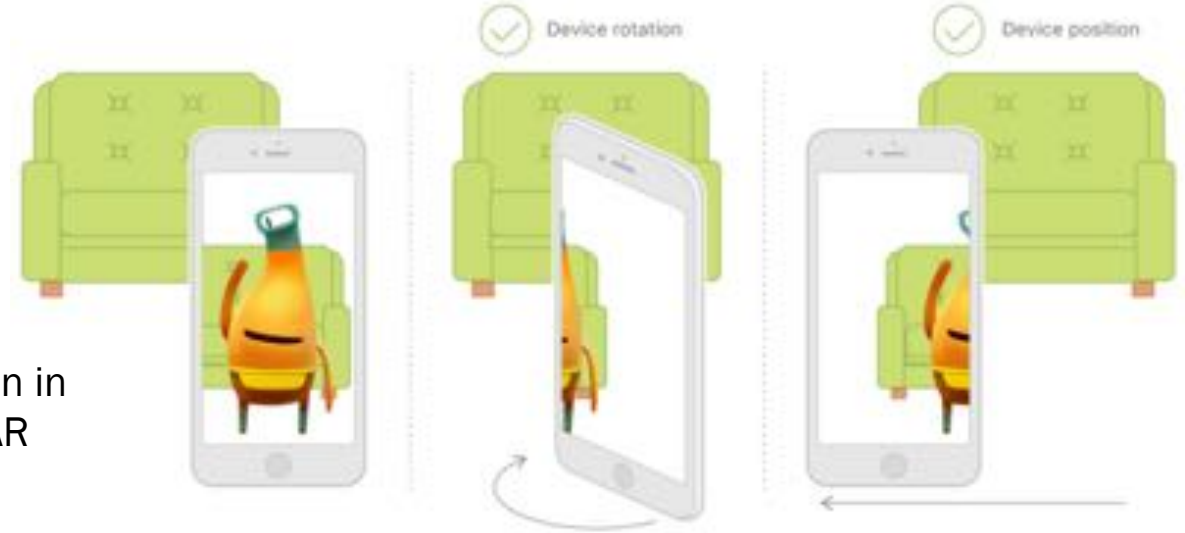


Orientation

The angles at which something is tilted.

Position

Position in space relative to the origin.

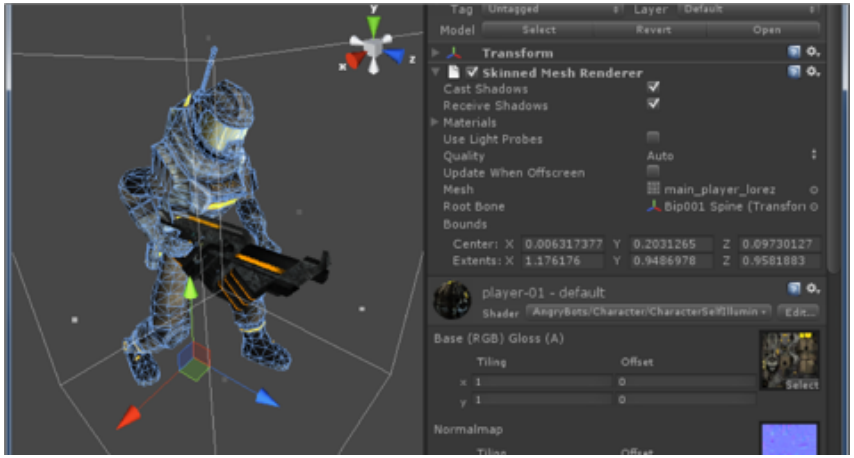


Origin

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

RENDERING

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



COMMON FILE FORMATS FOR 3D

.dae for Digital Asset Exchange files

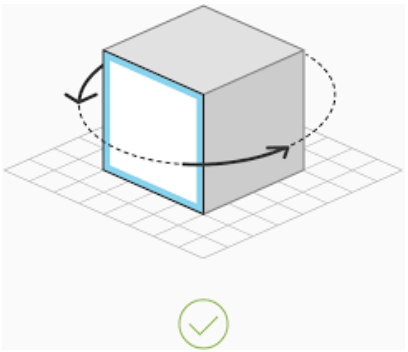
.obj for Wavefront 3D Object files with material .MTL files

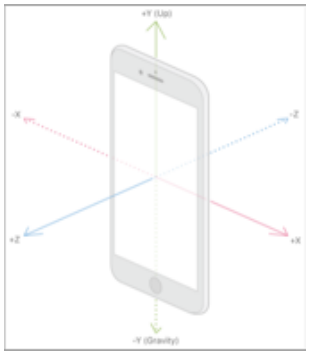
.3ds for 3D Studio Scene files by AutoDesk

.fbx for FBX files (Filmbox) by AutoDesk

USDZ for easy sharing

ARKit IN A NUTSHELL



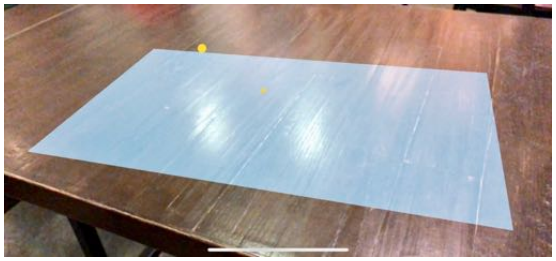


Real-World
Come from a camera as a backdrop or as an input

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

CORE FEATURES

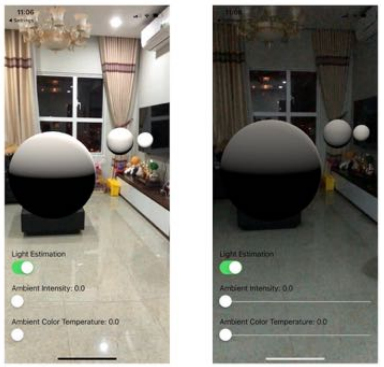


Plane Finding

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.

ARKit REQUIREMENTS

6s/6sPlus

7/7Plus

8/8Plus

iPhoneX

iPhoneXR

iPhoneXS

iPhoneXS Max

iPad 2017 and later

10.5-in. iPad Pro

11-in. iPad Pro

12.9-in. iPad Pro

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

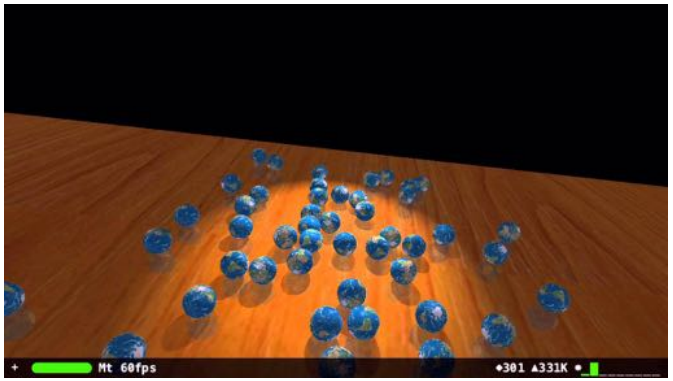
IT MAY BE CONVENIENT...

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

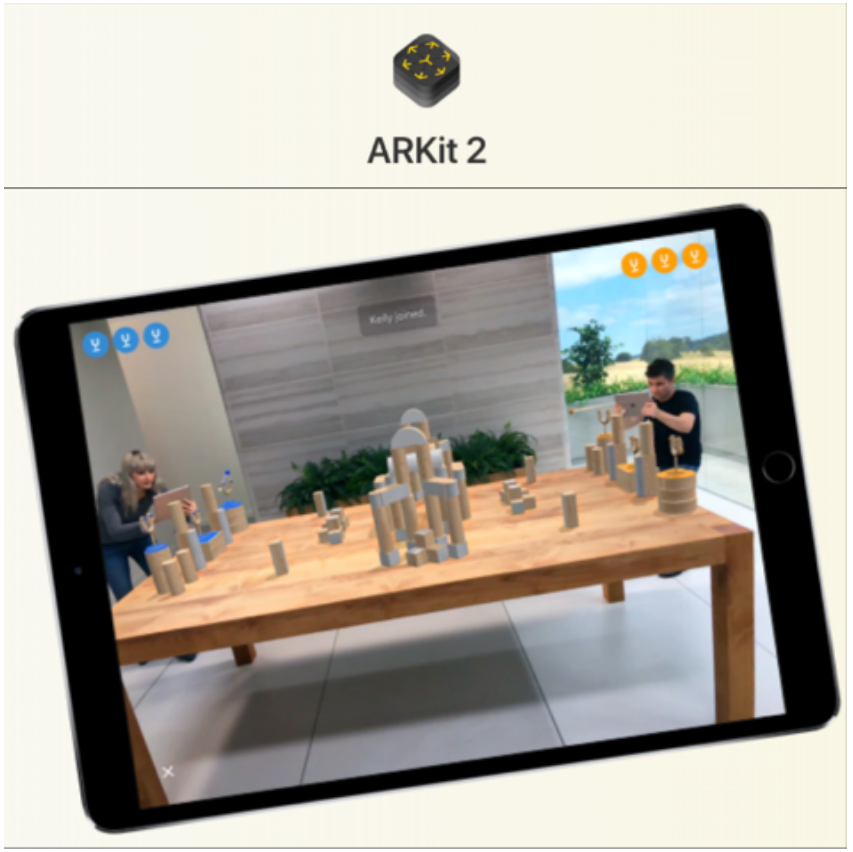
ARKit Object Tracking



SceneKit Physics

A lot more...

WHERE TO GO FROM HERE?



Apple's ARKit Documentation
ARKit

Apple's Human Interface Guidelines
Human Interface Guidelines

Awesome ARKit Repo
Awesome-ARKit

Thank You!