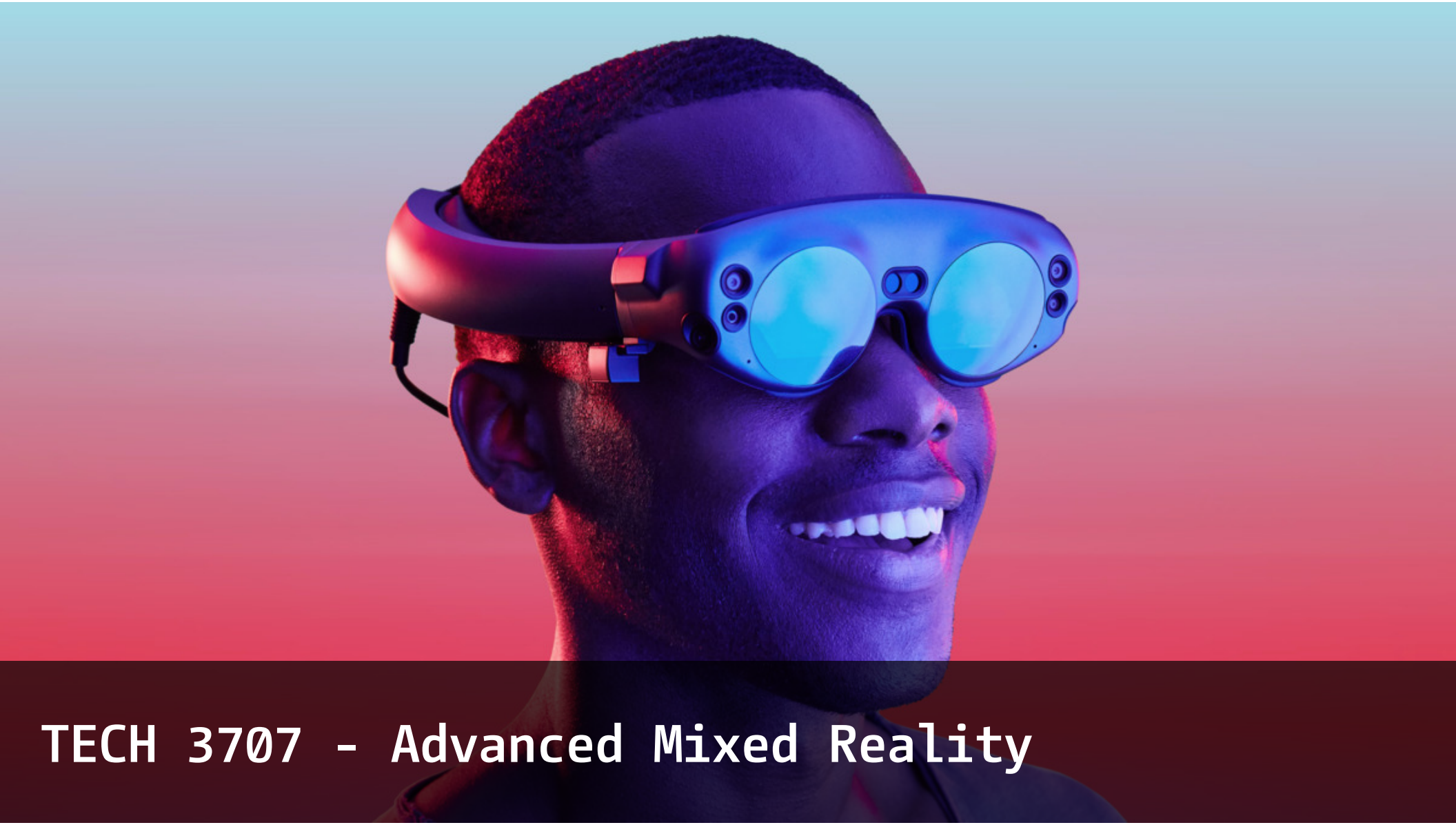


TECH 3707 - Advanced Mixed Reality

New Class (Again)

Most Up-to-date Syllabus:

https://github.com/ivaylopg/AdvancedMixedRealityStudio

Contact Me

ivaylo.getov@woodbury.edu

310.384.6382


ADVANCED?

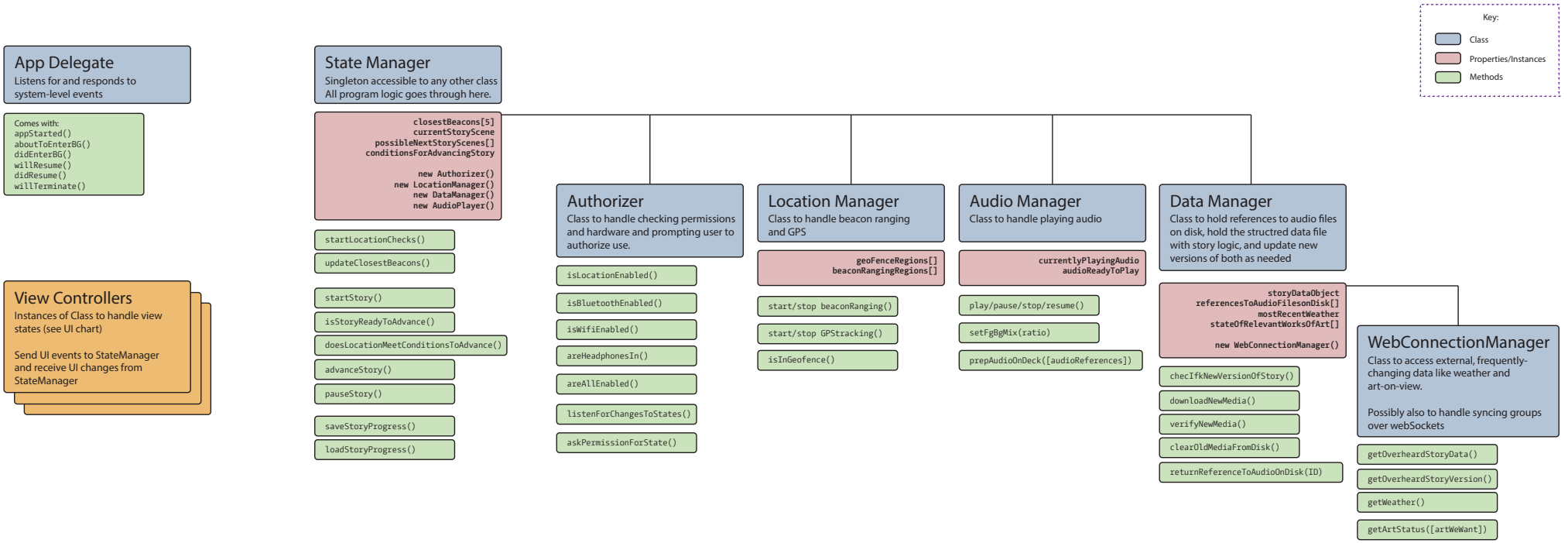

pro·gram·mer
n. an organism that turns
caffeine and pizza
into software

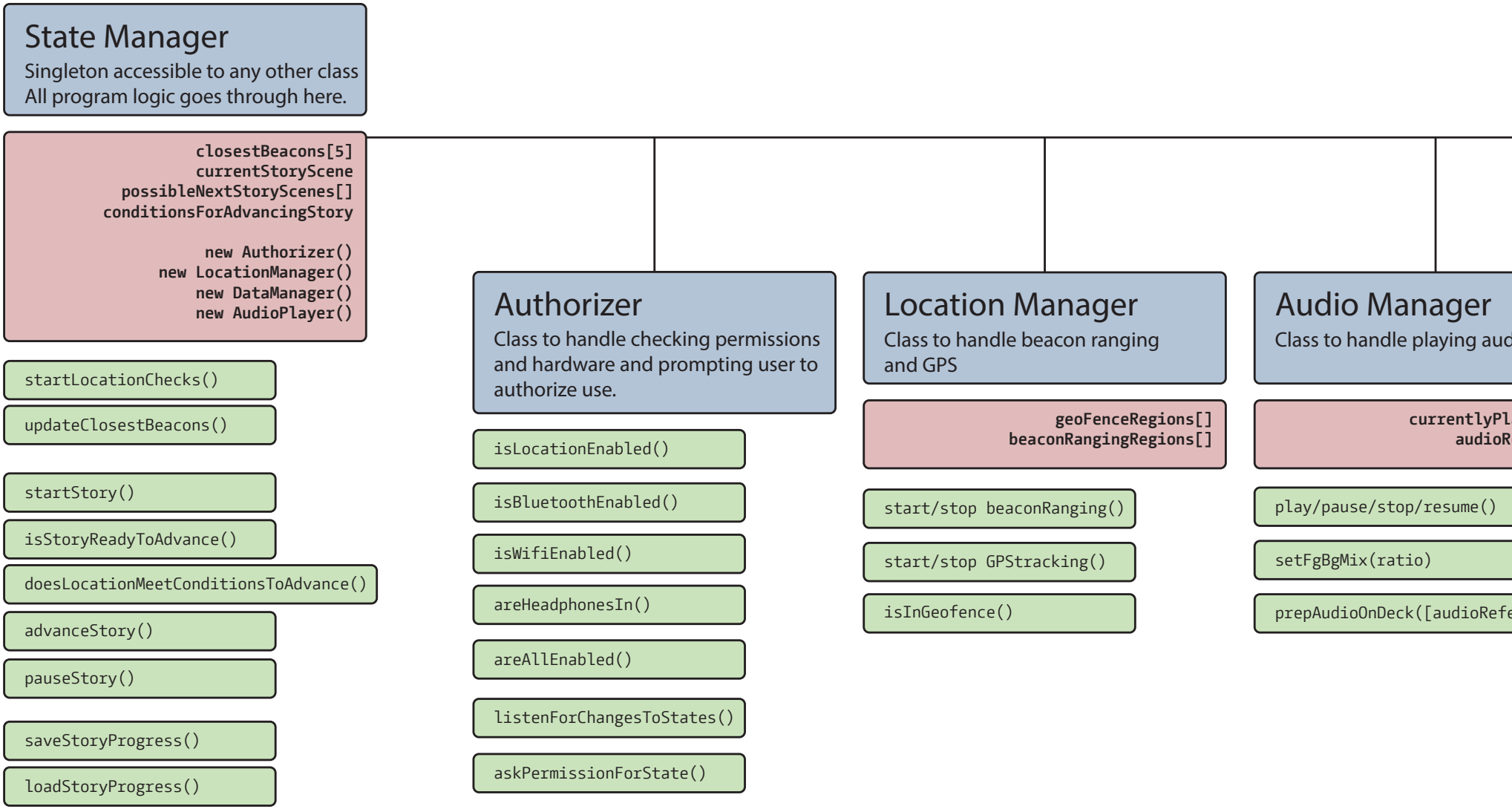

Broad Understanding About A Wide Range


NASA


Broad Understanding About A Wide Range
Deep Knowledge About
A Specific Area


Good Practices
Commented Code
Plan/Pseudocode
The project actually...uh...works.


App Delegate
Listens for and responds to system-level events
Comes with:
appStarted()
aboutToEnterBG()
didEnterBG()
willResume()
didResume()
willTerminate()
View Controllers
Instances of Class to handle view states (see UI chart)
Send UI events to StateManager and receive UI changes from StateManager
State Manager
Singleton accessible to any other class
All program logic goes through here.
closestBeacons[5]
currentStoryScene
possibleNextStoryScenes[]
conditionsForAdvancingStory
new Authorizer()
new LocationManager()
new DataManager()
new AudioPlayer()
startLocationChecks()
updateClosestBeacons()
startStory()
isStoryReadyToAdvance()
doesLocationMeetConditionsToAdvance()
advanceStory()
pauseStory()
saveStoryProgress()
loadStoryProgress()
Authorizer
Class to handle checking permissions and hardware and prompting user to authorize use.
isLocationEnabled()
isBluetoothEnabled()
isWifiEnabled()
areHeadphonesIn()
areAllEnabled()
listenForChangesToStates()
askPermissionForState()
Location Manager
Class to handle beacon ranging and GPS
geoFenceRegions[]
beaconRangingRegions[]
start/stop beaconRanging()
start/stop GPStracking()
isInGeofence()
Audio Manager
Class to handle playing audio
currentlyPlayingAudio
audioReadyToPlay
play/pause/stop/resume()
setFgBgMix(ratio)
prepAudioOnDeck([audioReferences])
Data Manager
Class to hold references to audio files on disk, hold the structred data file with story logic, and update new versions of both as needed
storyDataObject
referencesToAudioFilesonDisk[]
mostRecentWeather
stateOfRelevantWorksOfArt[]
new WebConnectionManager()
checIfkNewVersionOfStory()
downloadNewMedia()
verifyNewMedia()
clearOldMediaFromDisk()
returnReferenceToAudioOnDisk(ID)
WebConnectionManager
Class to access external, frequently-changing data like weather and art-on-view.
Possibly also to handle syncing groups over webSockets
getOverheardStoryData()
getOverheardStoryVersion()
getWeather()
getArtStatus([artWeWant])
Key:
Class
Properties/Instances
Methods


State Manager
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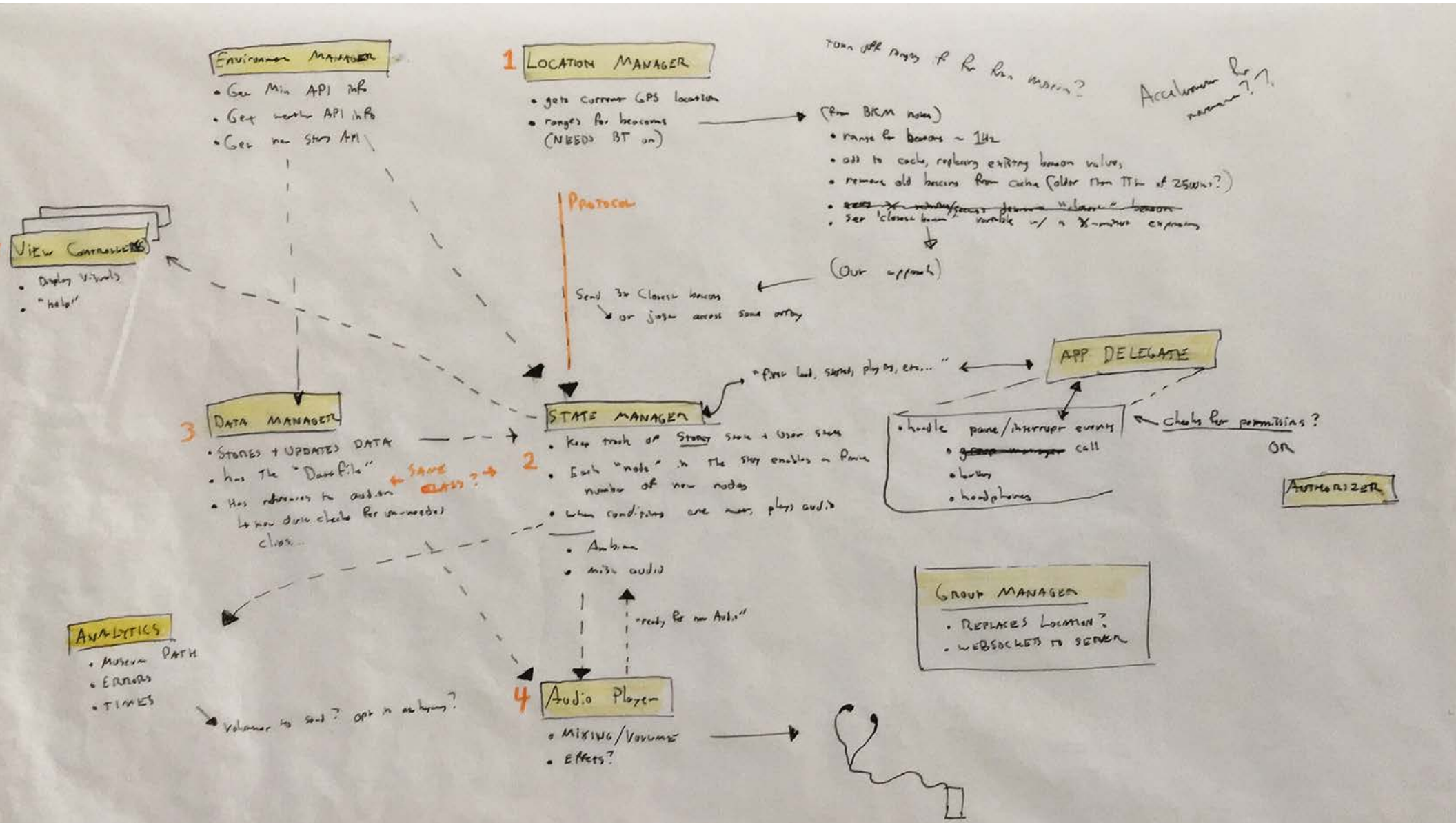
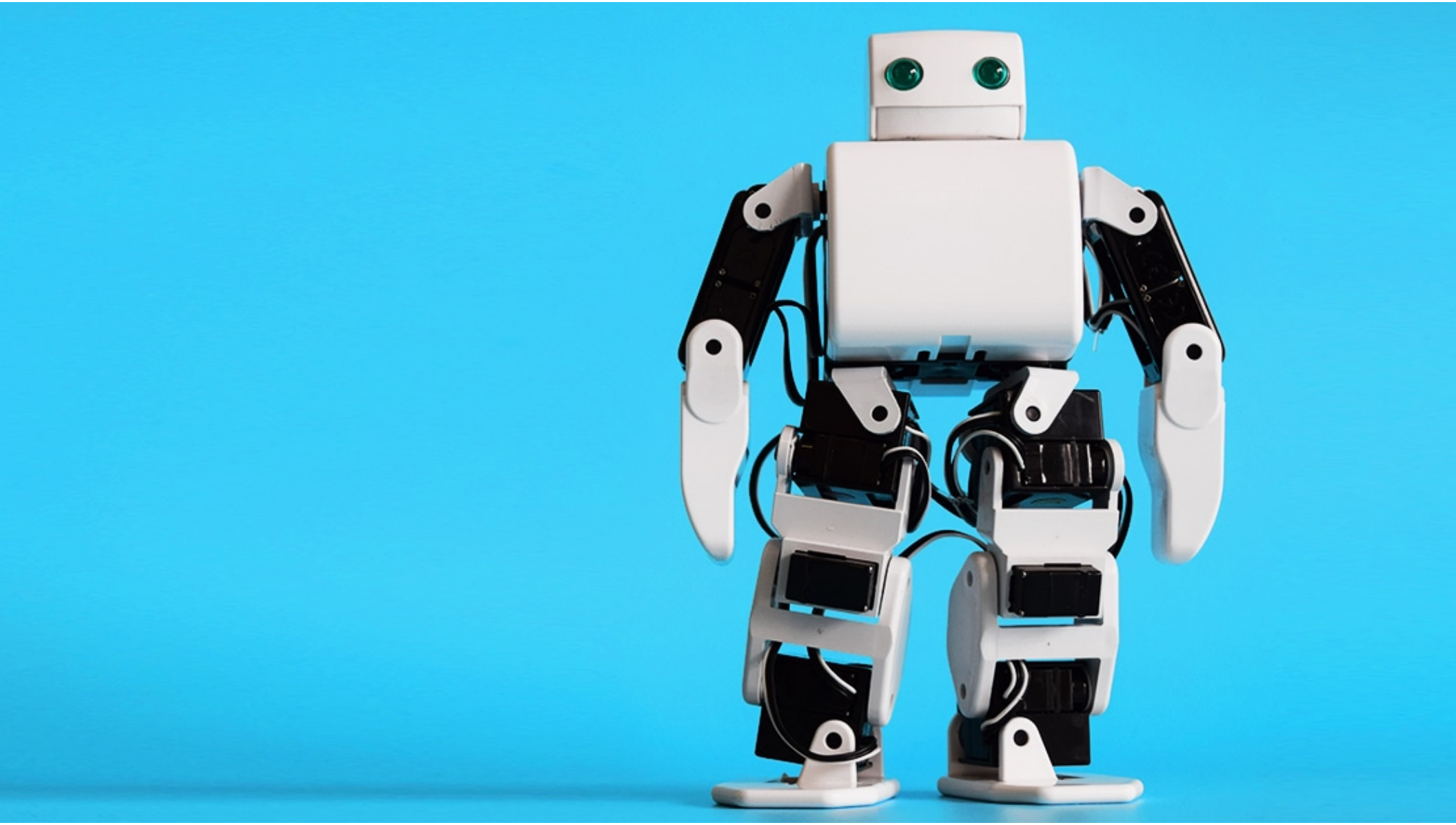
isInGeofence()
Audio Manager
Class to handle playing aud
currentlyPl
audioR
play/pause/stop/resume()
setFgBgMix(ratio)
prepAudioOnDeck([audioRefe


Environment Manager
• Get Min API info
• Get newer API info
• Get new Story API
1 Location Manager
• gets current GPS location
• ranges for beacons
(NEEDS BT on)
(from BKM notes)
• range for beacons ~ 1Hz
• add to cache, replacing existing beacon values
• remove old beacons from cache (older than TTL of 25sec?)
• sort 'closest beacon' variable w/ a X-minute expiration
(Our approach)
Send 3x Closest beacons
or just across some array
Protocol
View Controllers
• Display Visuals
• "Help"
3 Data Manager
• Stores + updates DATA
• has the "Data file"
• Has references to audio
to know data checks for when needed
class...
SAVE CLASS?
STATE MANAGER
• Keep track of Story state + User state
2
• Each "node" in the story enables a Pause
number of new nodes
• when conditions are met, plays audio
• Ambient
• misc audio
"first load, started, play by, etc..."
APP DELEGATE
• handle pause/interrupt events
• phone call
• battery
• headphones
checks for permissions?
OR
AUTHORIZER
GROUP MANAGER
• REPLACES LOCATION?
• WEBSOCKETS TO SERVER
Analytics
• Museum Path
• Errors
• Times
Volunteer to send? opt in on beginning?
"ready for new Audio"
4 Audio Player
• Mixing/Volume
• Effects?


NASA

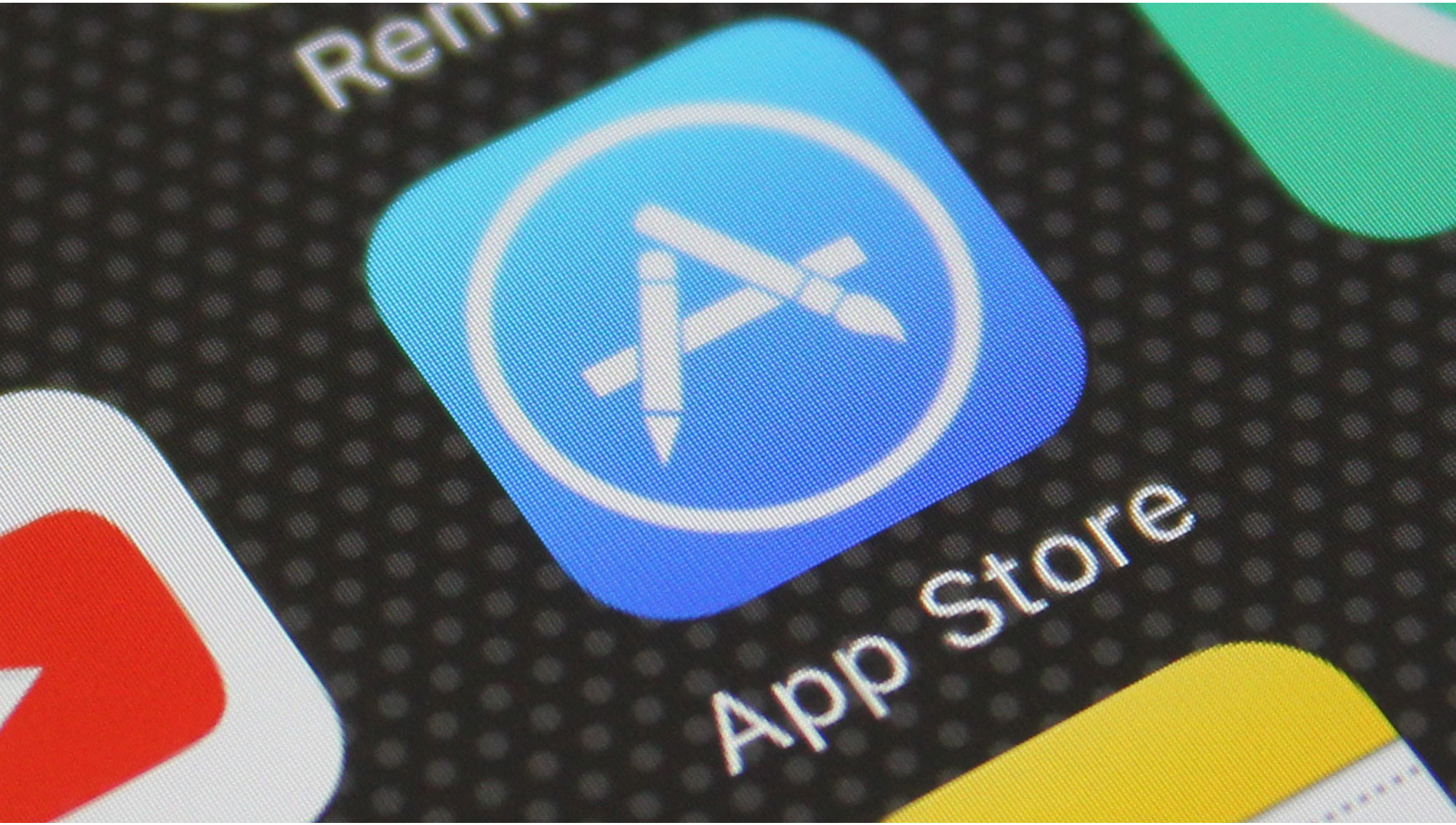



What are we focusing on?


ASTRONAUT


Powered by
Vuforia™
SCIONS OF HELIOS


Smarter Objects by Valentin Heun, Shunichi Kasahara, Pattie
MIT Media Lab


App Store


Assignments
First Project - Interactive AR - 20%
Final Project - Shared AR Experience - 30%
Participation, attendance, and classwork - 50%


Format
Chapter 0
Recap Topics
Making sure everyone is back up to speed
and re-familiarized with Unity and C# development.

Format

Chapter 1
Expanding on Fundamentals

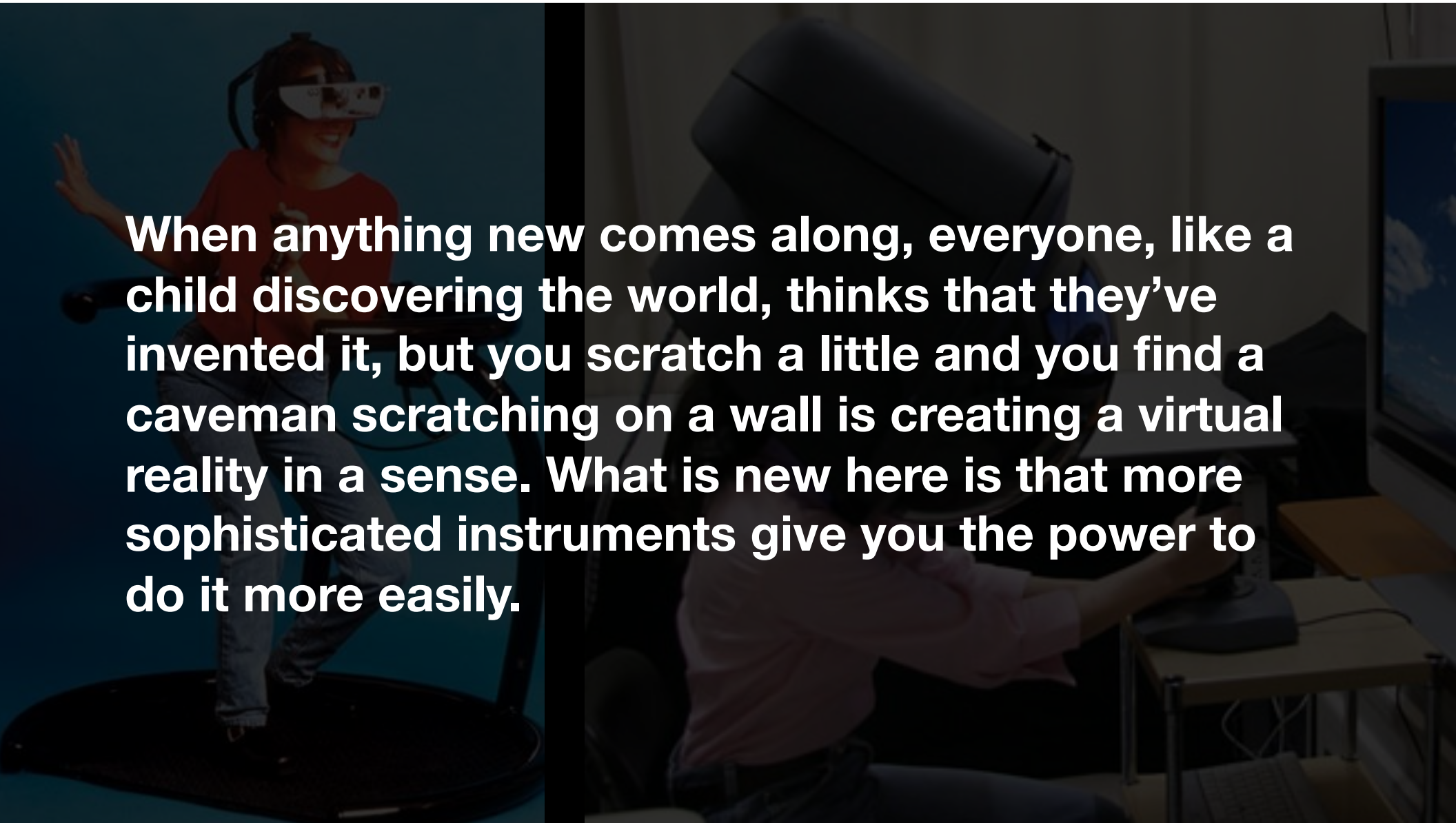
A series of class discussions, speakers, and exercises.
Deep dive into specific concepts and explore techniques.


Format
Chapter 2
Interactive AR
We will be developing a mobile AR application
based on the Vuforia framework


Format
Chapter 3
Shared AR Experience
We will build on the previous project
to develop a multi-user mobile AR app


hello.

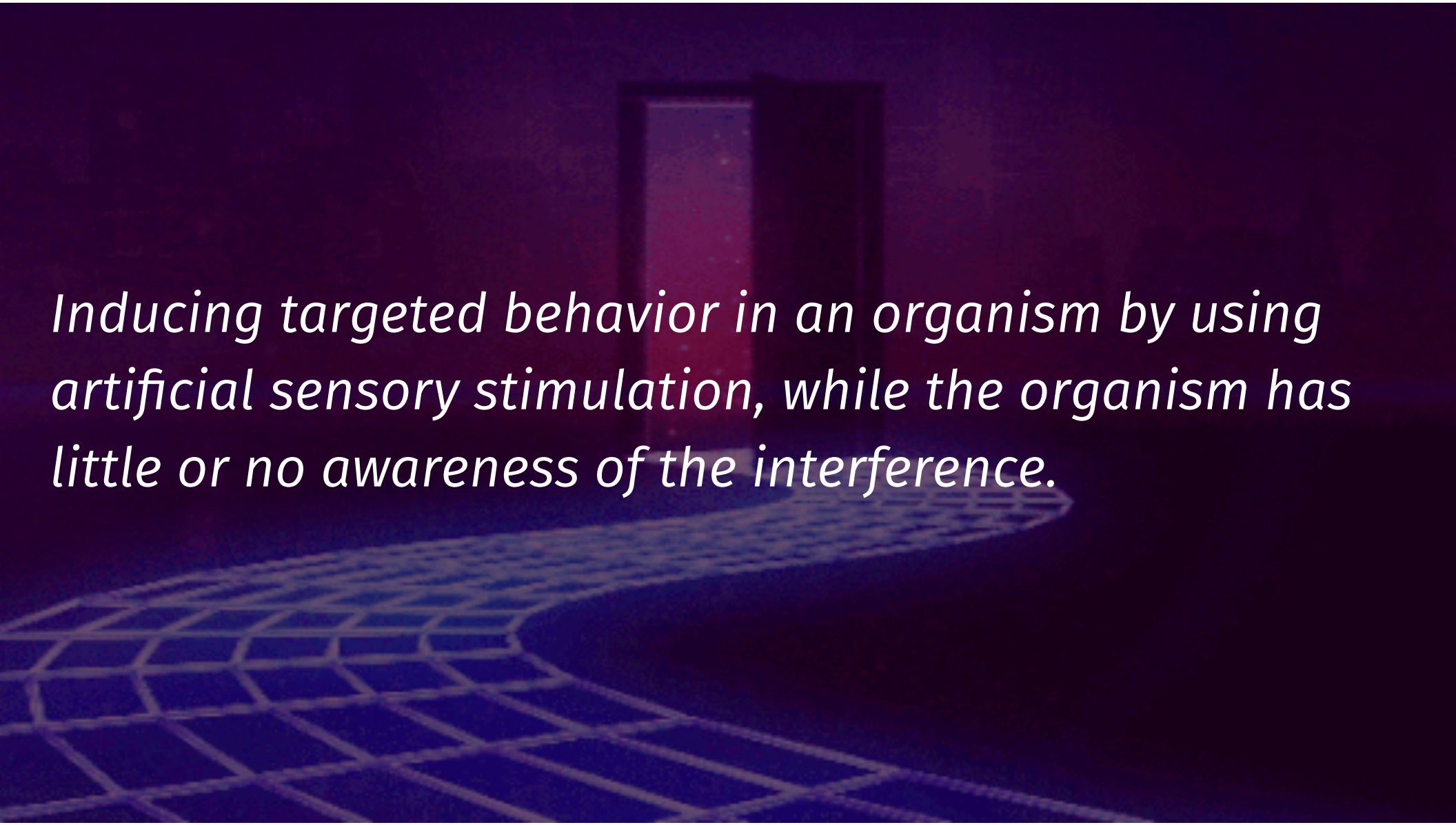
Let’s Go!

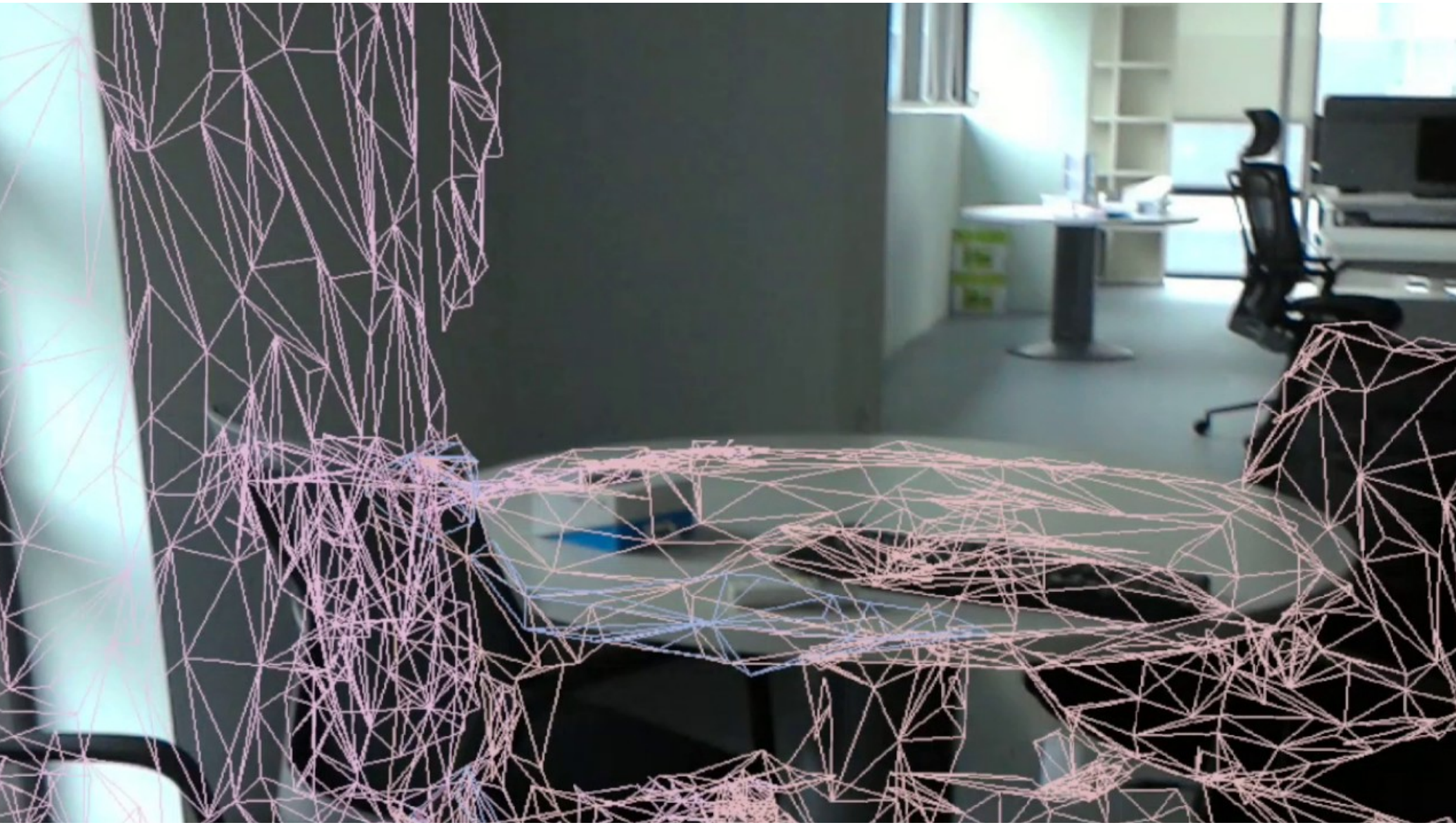


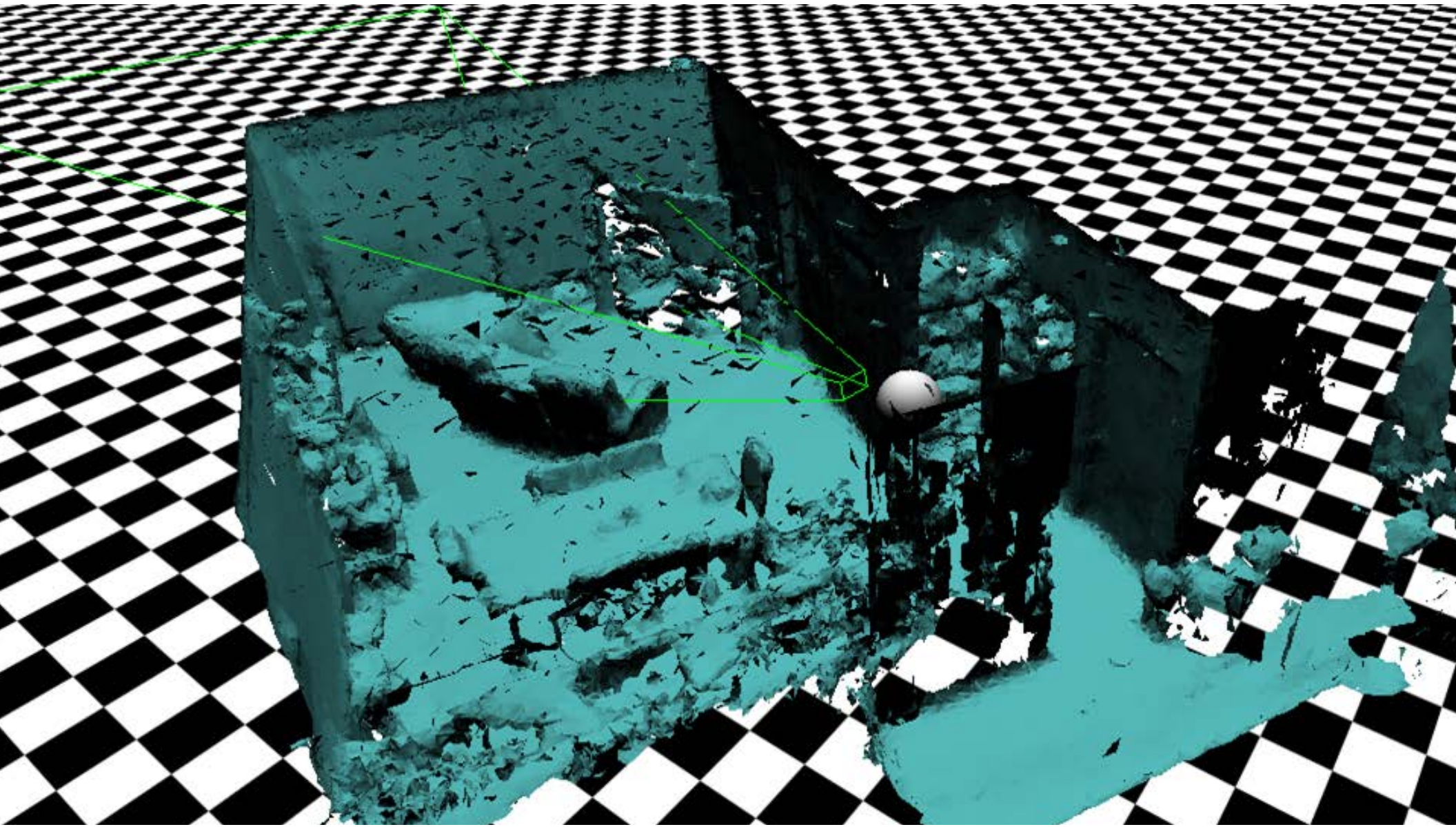
When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating a virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do it more easily.

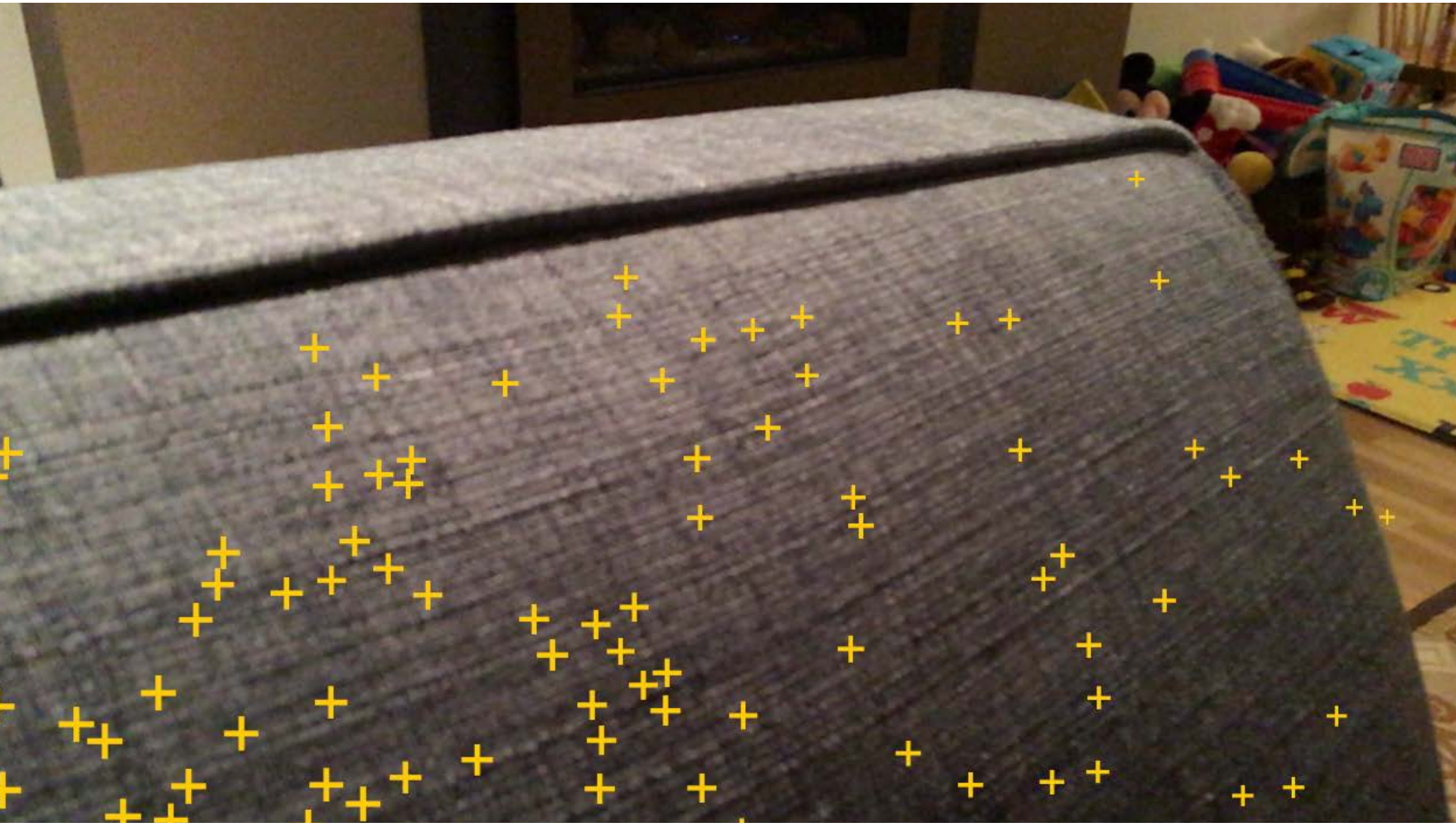
Augmented Reality

What is AR/VR/MR?

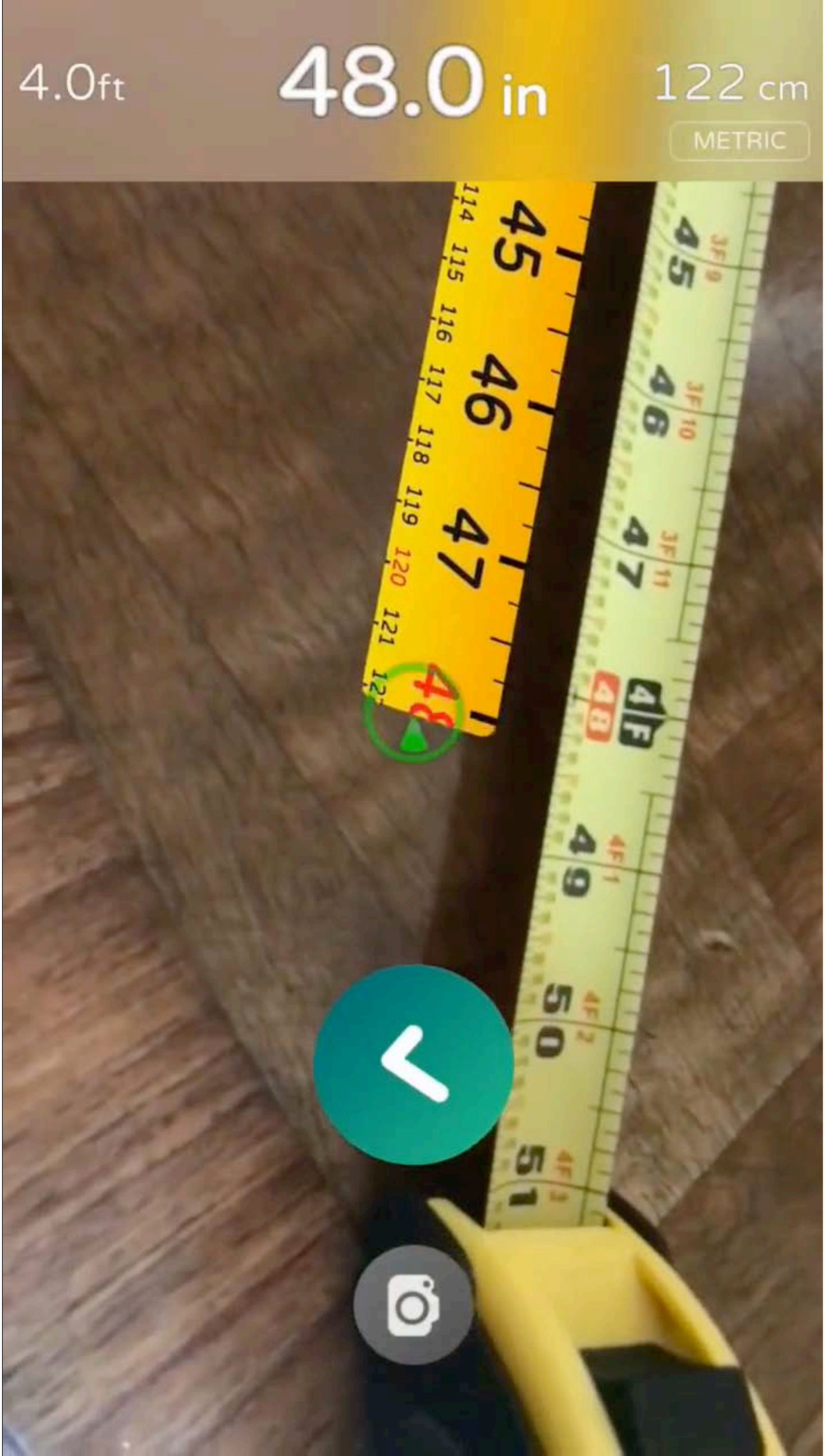

Inducing targeted behavior in an organism by using artificial sensory stimulation, while the organism has little or no awareness of the interference.

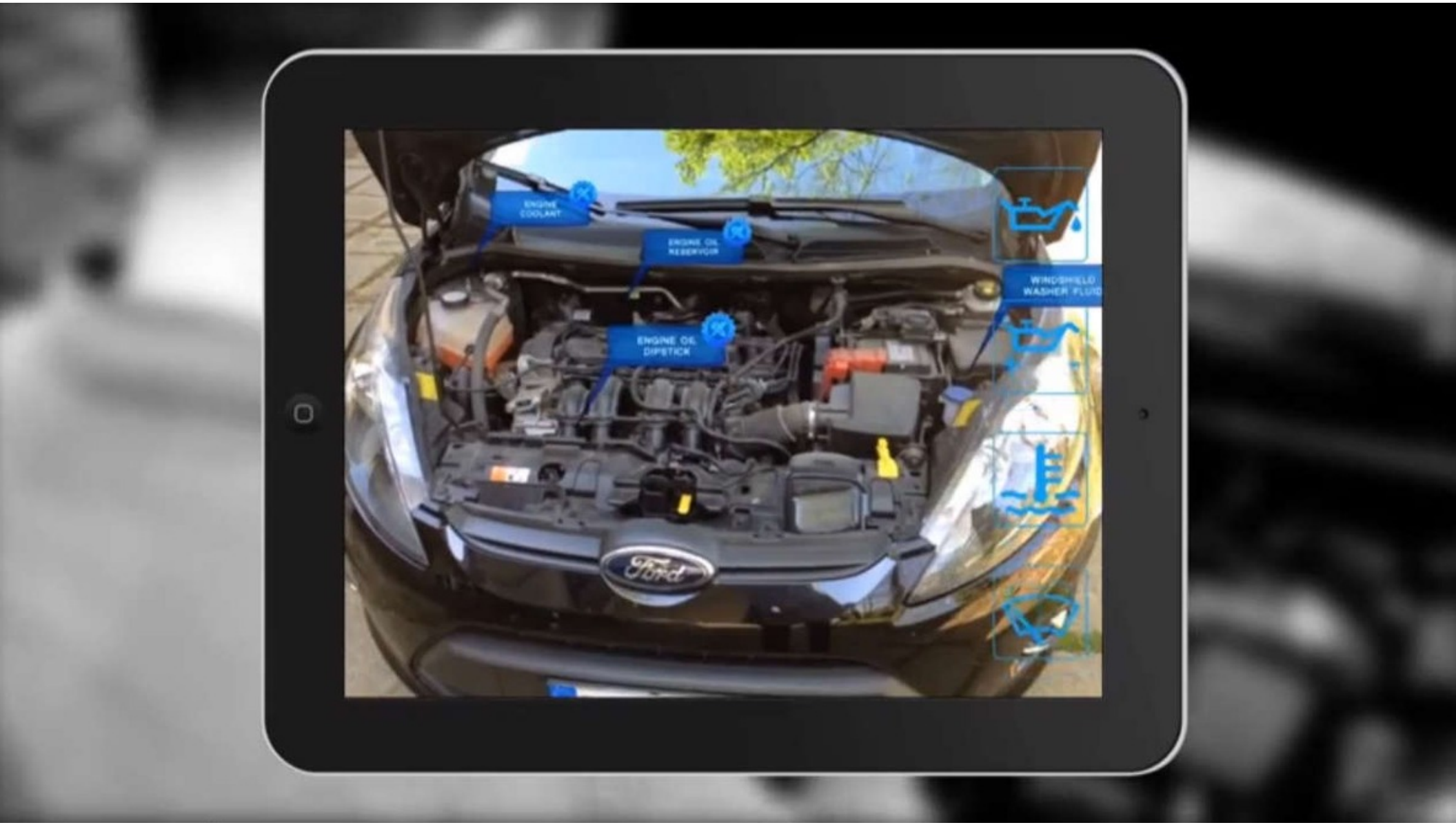


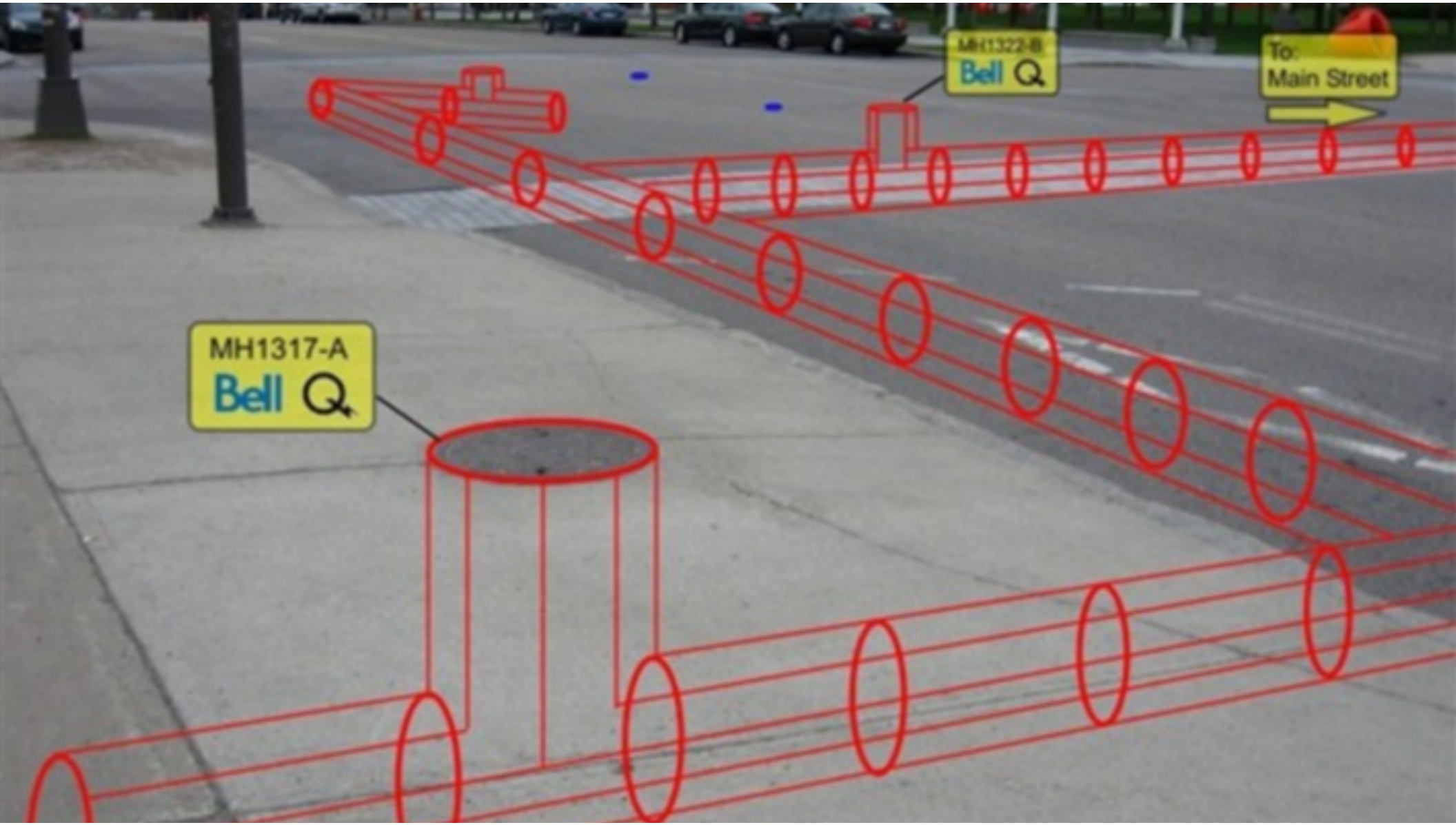


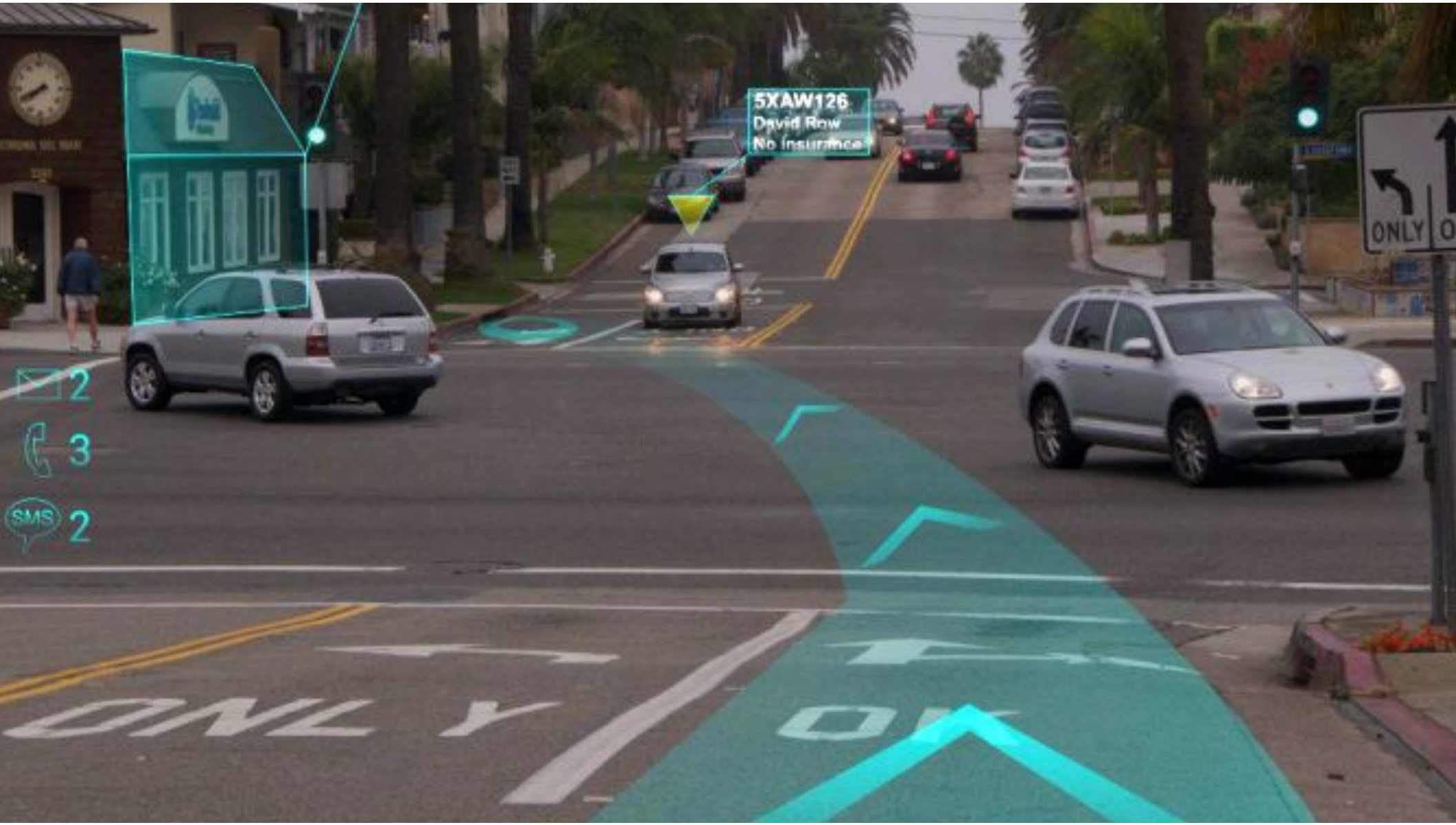



Pokémon
GO


4.0ft
48.0 in
122 cm
METRIC

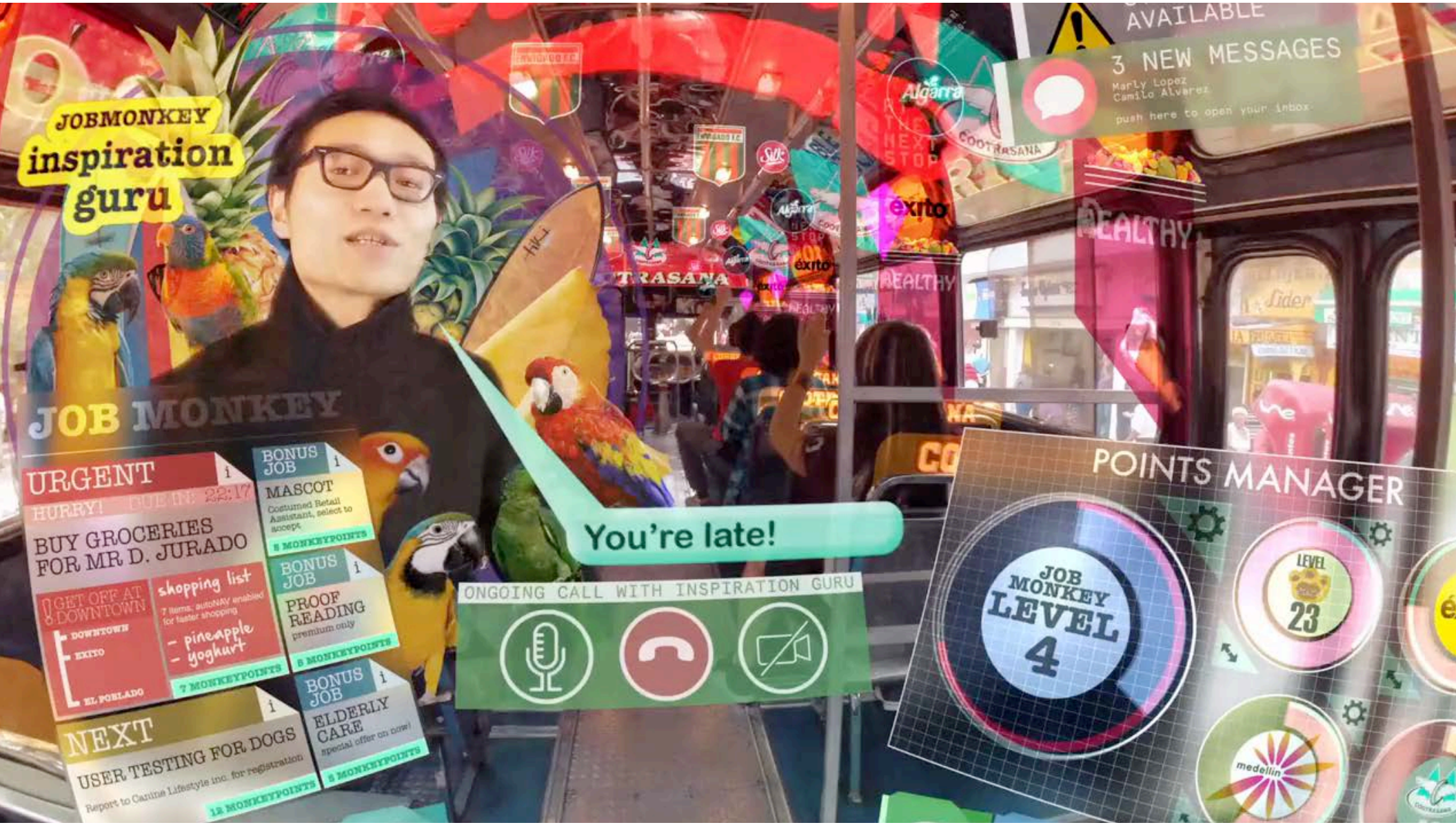

ENGINE COOLANT
ENGINE OIL RESERVOIR
ENGINE OIL DIPSTICK
WINDSHIELD WASHER FLUID


MH1317-A
Bell
MH1322-B
Bell
To:
Main Street


5XAW126
David Row
No Insurance
2
3
SMS
2
ONLY
ONLY


自転車を除く
一方通行

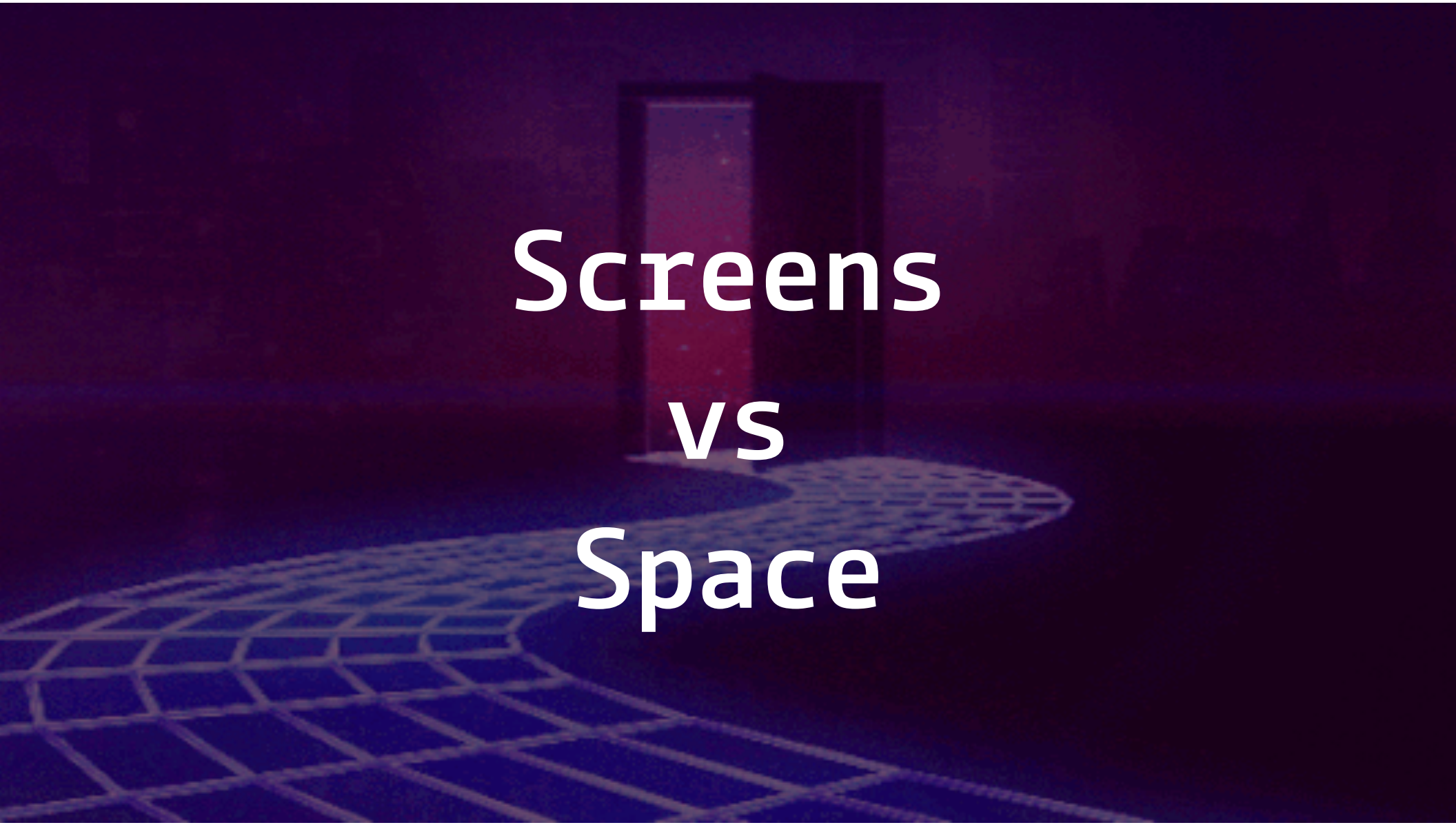

WINNER!
2010 TONY AWARD
BEST MUSICAL
EMPHIS
BEST NEW COMEDY"
TV GUIDE
DON'T BELIEVE THE LIBERAL MEDIA!
media research center
McDonald's
Restaurant
FRIDAYS
TOSHIBA LED LIGHTING
TOSHIBA
TDK
PITBULL
SONY
Hankook
driving emotion
WRATH OF THE TITANS
MARCH 30
Kodak
UFC
SAT APRIL 21 • LIVE ON PAY-
Broadway

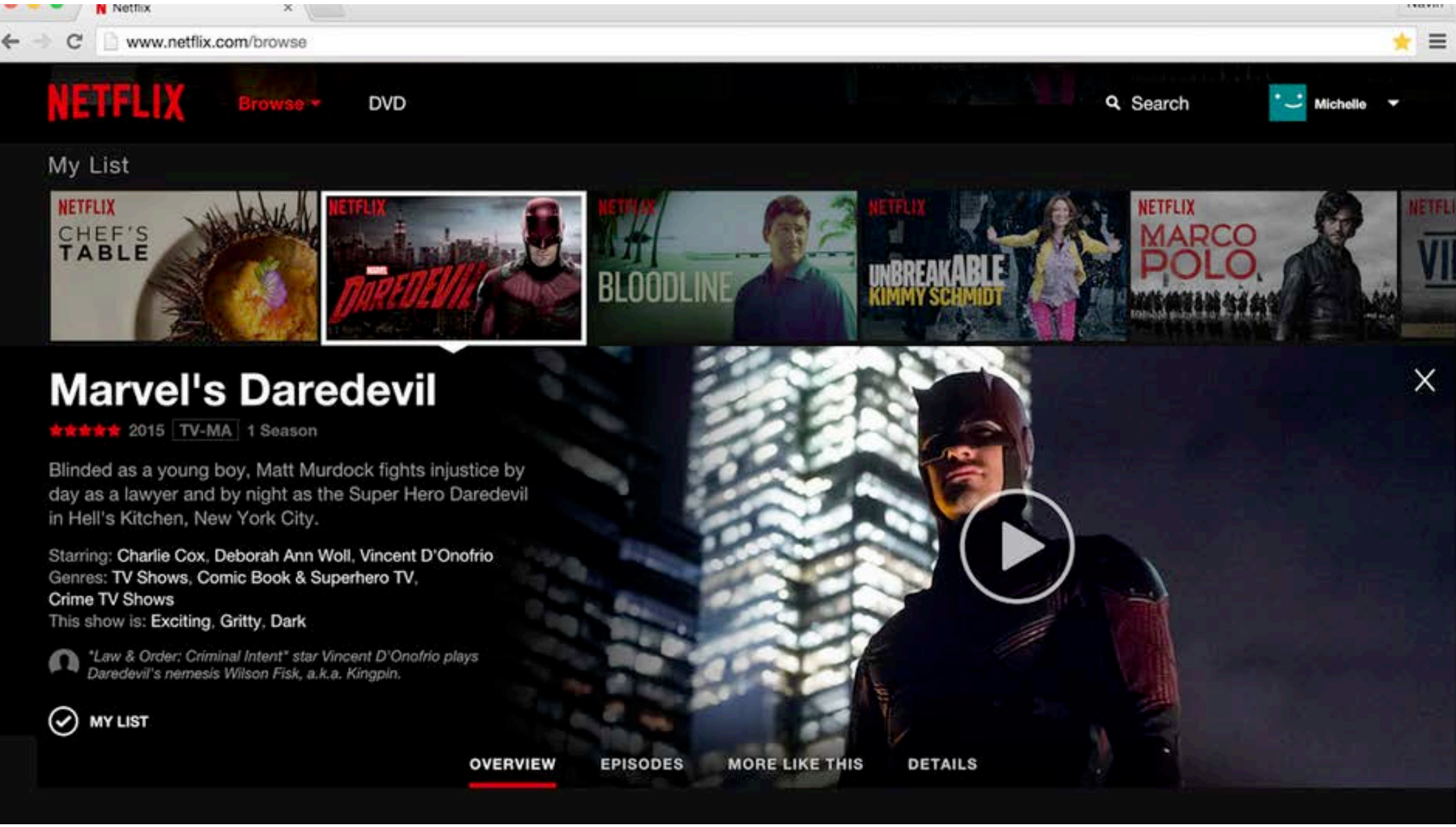

JOBMONKEY
inspiration guru
JOB MONKEY
URGENT
HURRY! DUE IN: 22:17
BUY GROCERIES FOR MR D. JURADO
GET OFF AT 8 DOWNTOWN
DOWNTOWN
EXITO
EL POBLADO
shopping list
7 items, autoNAV enabled for faster shopping
- pineapple
- yoghurt
7 MONKEYPOINTS
BONUS JOB
MASCOT
Costumed Retail Assistant, select to accept
8 MONKEYPOINTS
BONUS JOB
PROOF READING
premium only
8 MONKEYPOINTS
BONUS JOB
ELDERLY CARE
special offer on now!
8 MONKEYPOINTS
NEXT
USER TESTING FOR DOGS
Report to Canine Lifestyle inc. for registration
12 MONKEYPOINTS
You're late!
ONGOING CALL WITH INSPIRATION GURU
AVAILABLE
3 NEW MESSAGES
Marly Lopez
Camilo Alverez
push here to open your inbox
POINTS MANAGER
JOB MONKEY LEVEL 4
LEVEL 23
medellin


SLMIN .SYS 12P 20-Dec-85
XL .SYS 4P 20-Dec-85
SP .SYS 6P 13-Aug-86
RT11SJ.SYS 70P 13-Aug-86
NL .SYS 2P 13-Aug-86
SU .SYS 9P 31-Aug-85
BASIC .SAV 56 24-Aug-79
DATIME.SAV 4 20-Dec-85
DUMP .SAV 9 20-Dec-85
TSXMOD.SAV 78 27-Nov-82
HARRIS.SAV 41 12-Jun-85
START .F3G 2 21-Dec-81
EM1A .STM 15P 02-Feb-83
STAMD .LIN 12P 15-Aug-83
EM1B .STM 19 11-Feb-83
JKFLIP.FOR 3 08-Mar-86
ANNOT .SAV 38 18-Apr-83
DUO .DIR 18 16-Jul-86
DIR .DIF 26 16-Jul-86
DEMOBG.OBJ 1 -BAD-
114 Files, 5949 Blocks
14433 Free blocks
.0
VM .SYS 3P 13-Aug-86
LD .SYS 6P 23-Aug-86
PL .SYS 6P 13-Aug-86
DU .SYS 6P 13-Aug-86
TT .SYS 2P 13-Aug-86
RL02DC.SYS 71P 21-Aug-84
BINCOM.SAV 24 20-Dec-85
DIR .SAV 19 20-Dec-85
DUP .SAV 47 20-Dec-85
FORTRA.SAV 206 21-Aug-85
LET .SAV 5 20-Dec-85
RETRO .OBJ 1515P 16-Aug-88
TSXUCL.TSX 22 07-Mar-82
TSXV6 .MSG 1P 04-Sep-85
JKFLIP.SAV 30 08-Mar-86
RT11FB.SYS 93P 20-Dec-85
TSXP23.NEW 1200P 27-Nov-82
DL .DIR 7 16-Jul-86
DEMOFG.OBJ 1 -BAD-
EVAN .ID 1
digital VT100

Expectations

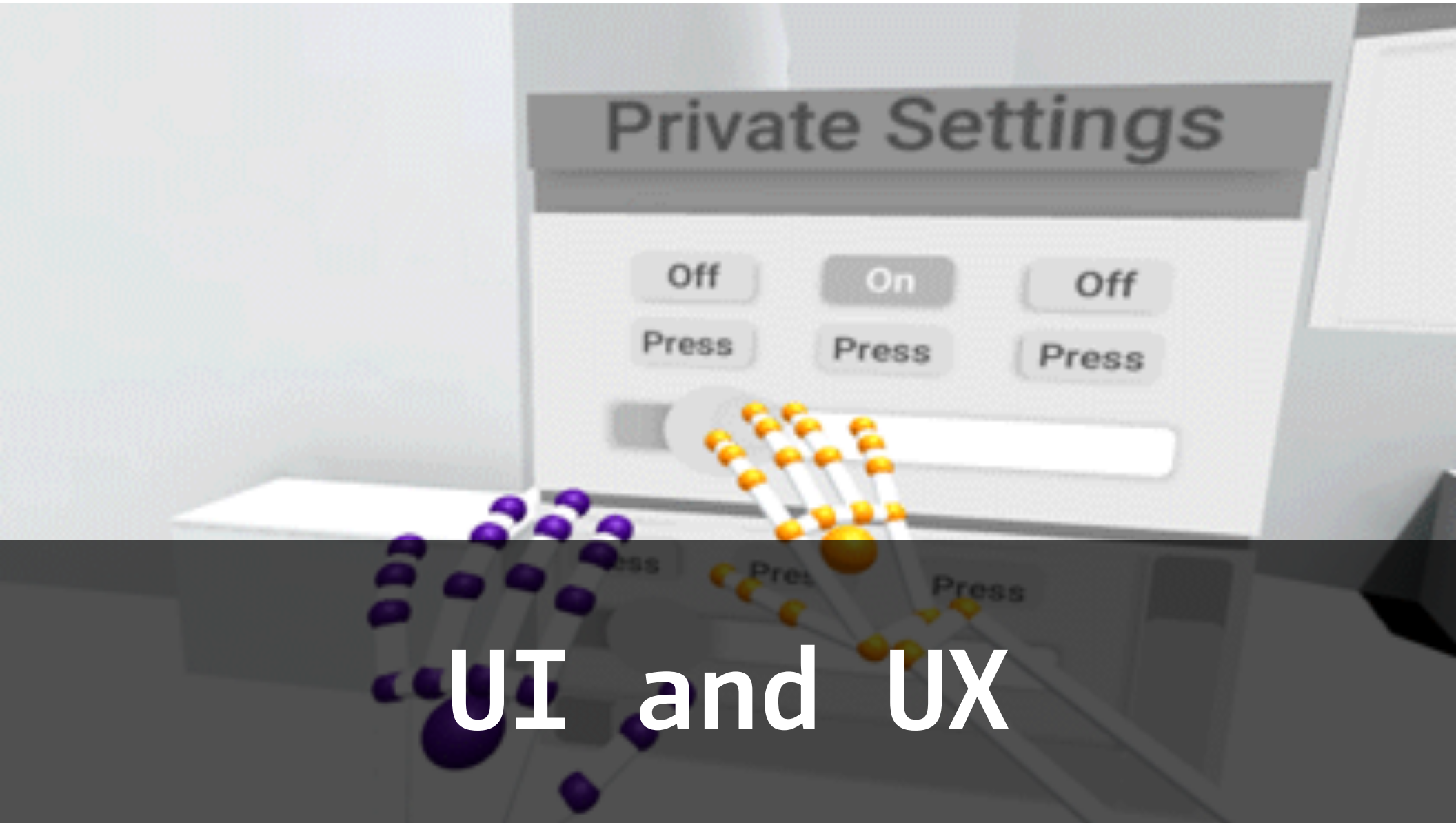
TO
LIST
1
3


Screens
vs
Space


Netflix
www.netflix.com/browse
NETFLIX
Browse
DVD
Search
Michelle
My List
NETFLIX
CHEF'S TABLE
NETFLIX
DAREDEVIL
NETFLIX
BLOODLINE
NETFLIX
UNBREAKABLE KIMMY SCHMIDT
NETFLIX
MARCO POLO
Marvel's Daredevil
2015
TV-MA
1 Season
Blinded as a young boy, Matt Murdock fights injustice by day as a lawyer and by night as the Super Hero Daredevil in Hell's Kitchen, New York City.
Starring: Charlie Cox, Deborah Ann Woll, Vincent D'Onofrio
Genres: TV Shows, Comic Book & Superhero TV, Crime TV Shows
This show is: Exciting, Gritty, Dark
"Law & Order: Criminal Intent" star Vincent D'Onofrio plays Daredevil's nemesis Wilson Fisk, a.k.a. Kingpin.
MY LIST
OVERVIEW
EPISODES
MORE LIKE THIS
DETAILS


NETFLIX
MARCO POLO
BLOODLINE
ORANGE IS THE NEW BLACK
NETFLIX


Pokémon
GO
TM
AR
Pikachu
CP 62



UI and UX

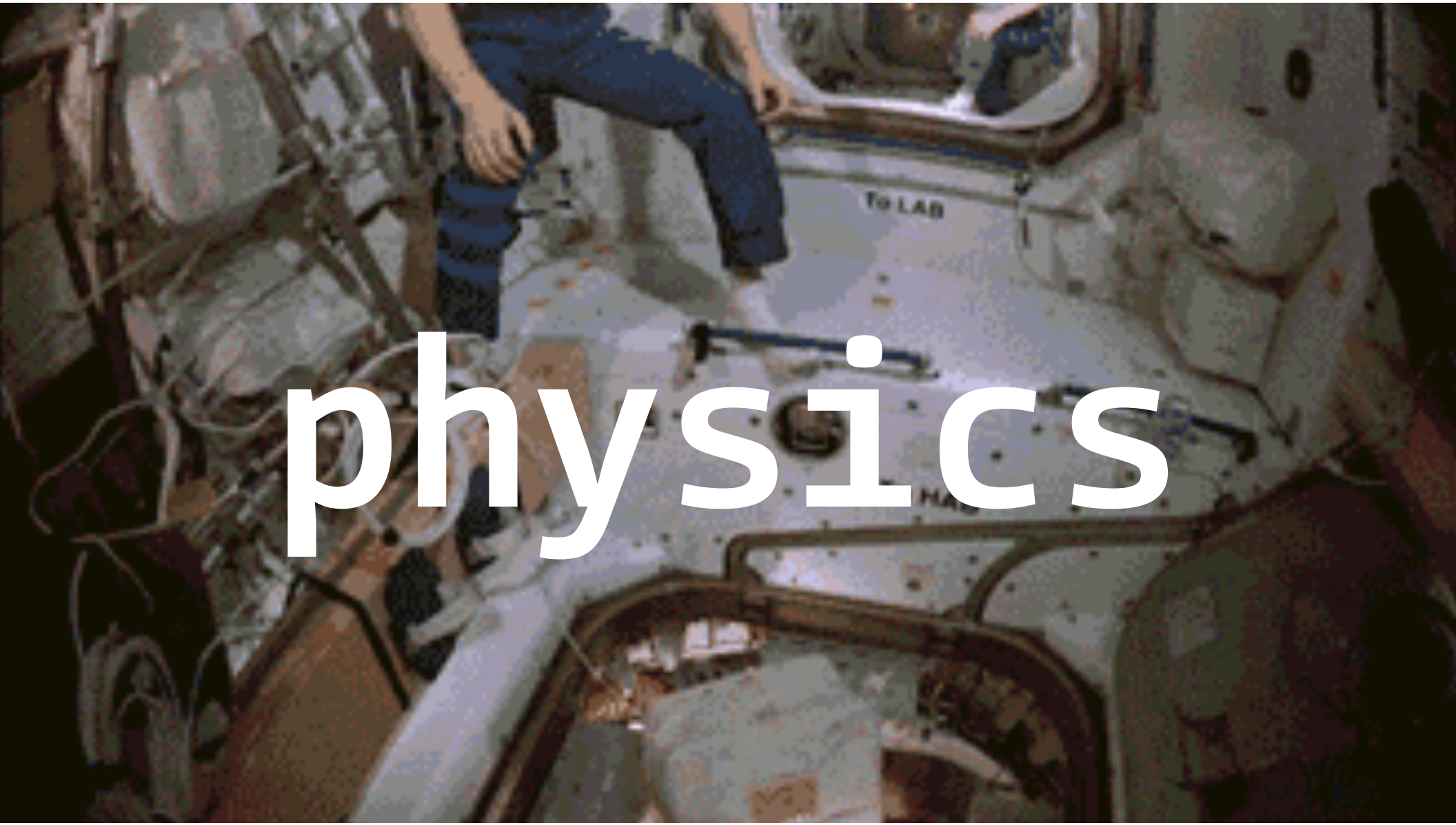
Manipulation

Exploration


FIRE
EXTINGUISHER


Scene
Asset Store
Game
Shaded
2D
Gizmos
ASTRONAUT
DRONE
OXYGEN
FISSURE

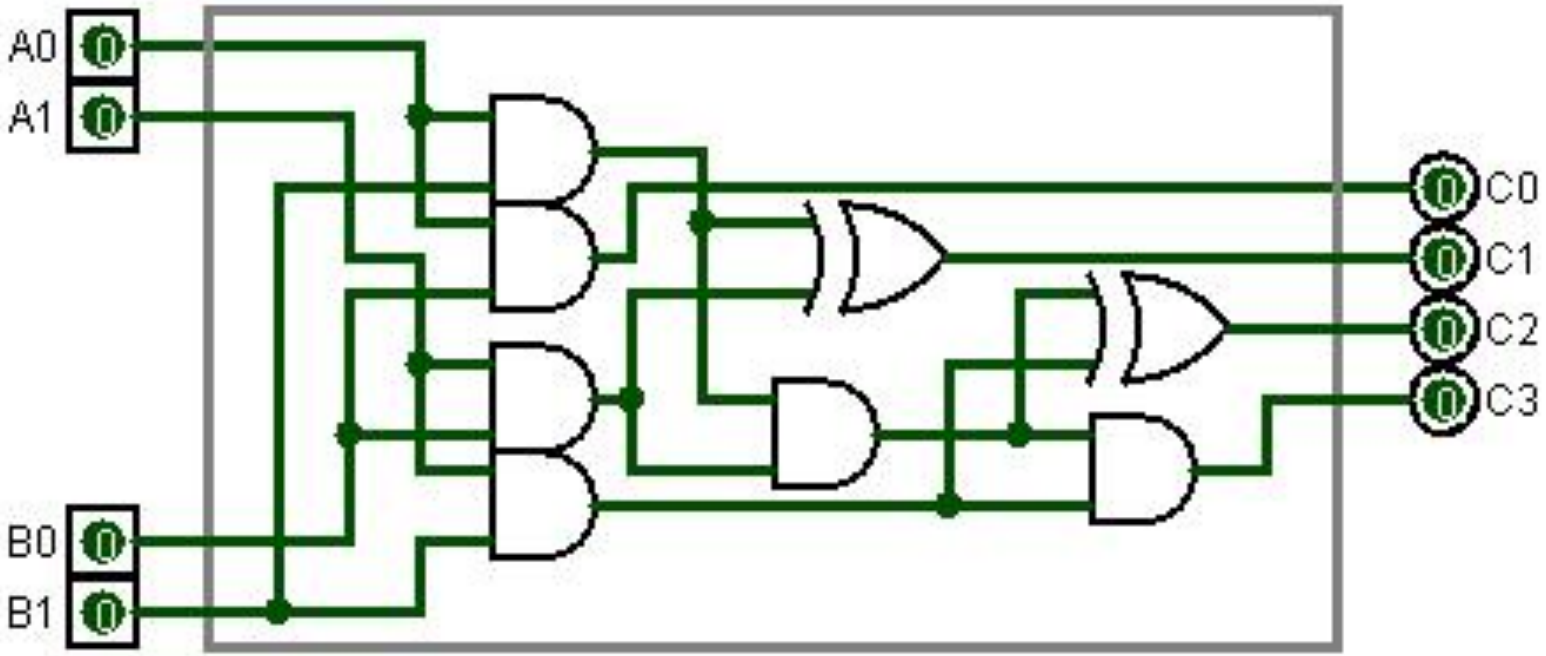
abstraction

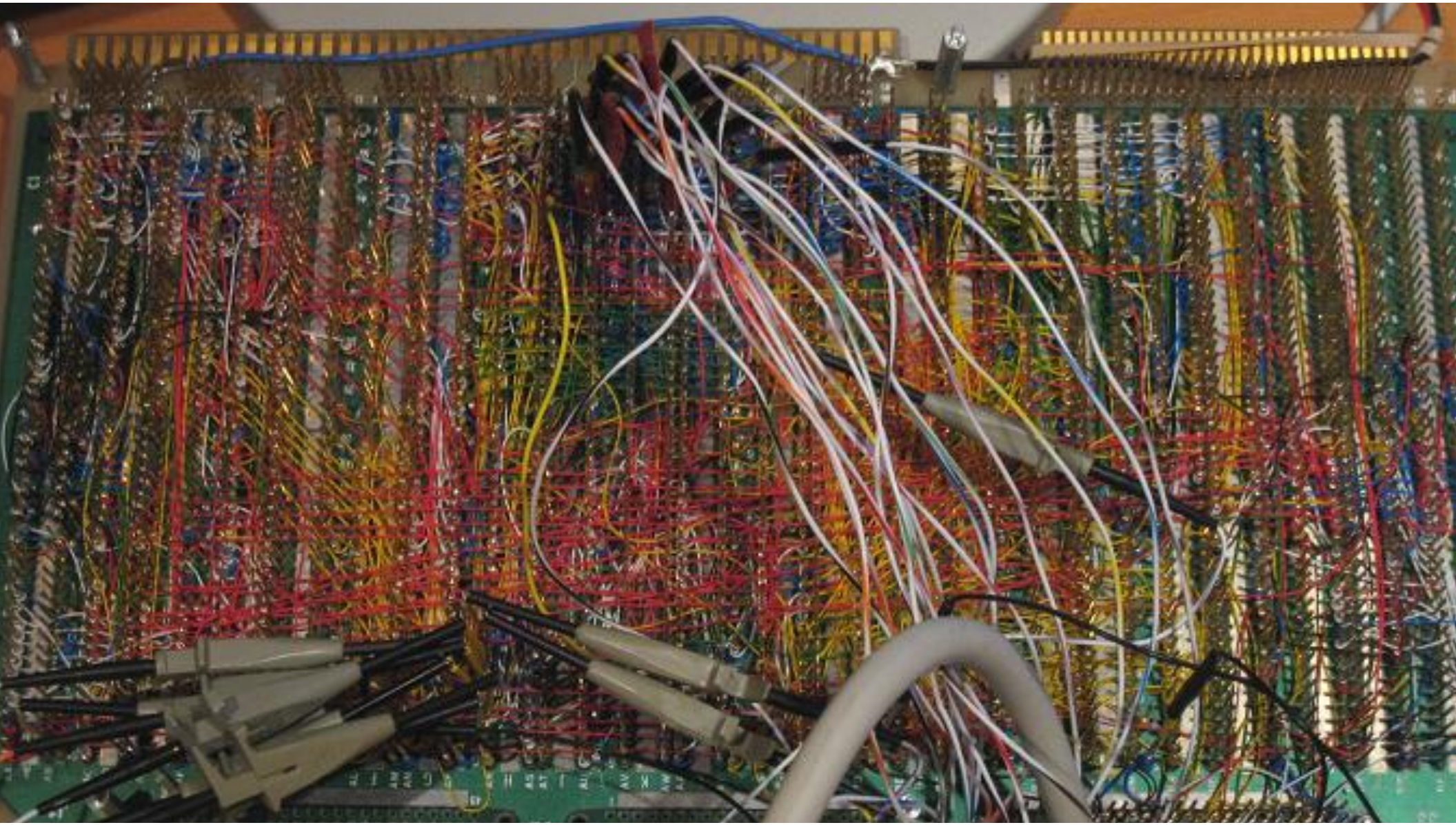


physics

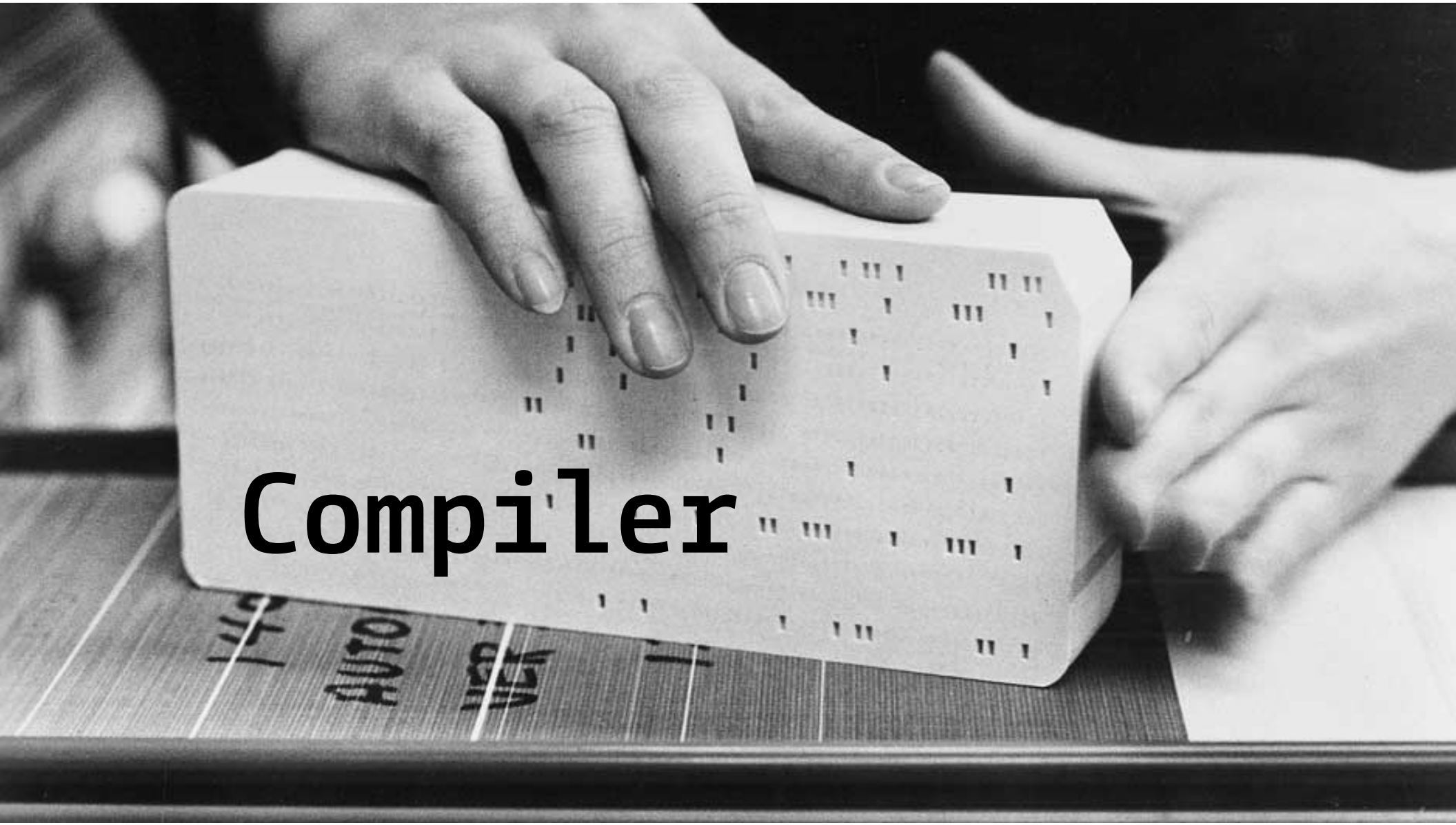
designing for the real world

abstraction


A0
A1
B0
B1
C0
C1
C2
C3



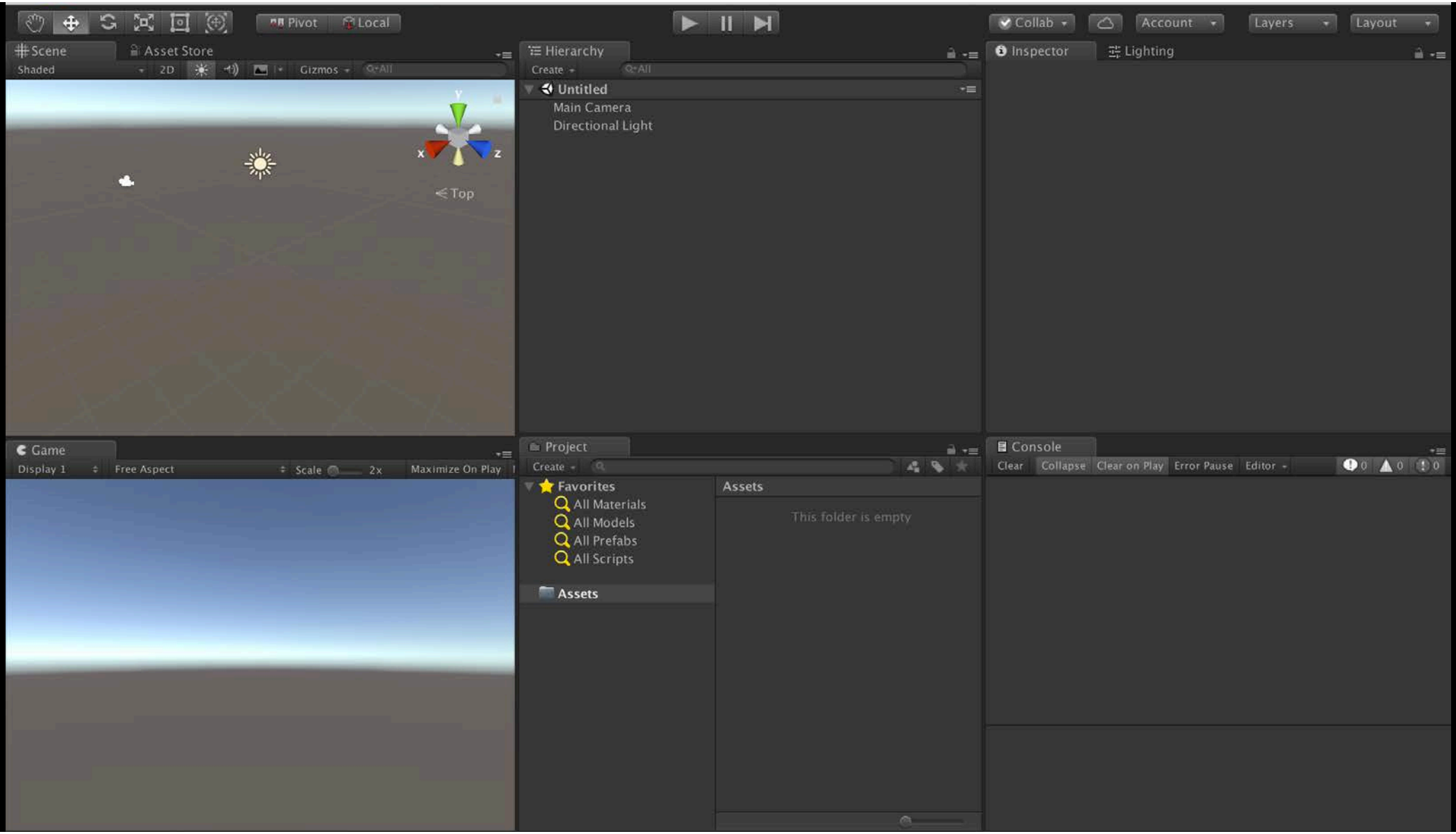
```
// UdpPacket provides packetIO over UDP
public class UDPPacketIO {

  private UdpClient Sender;
  private UdpClient Receiver;
  private bool socketsOpen;
  private string remoteHostName;
  private int remotePort;
  private int localPort;

  private string multicastAddress;
  private bool enableMulticast;



  public UDPPacketIO(string hostIP, int remotePort, int localPort, bool enableMulticast=false, string multicastAddress=null) {
    RemoteHostName = hostIP;
    RemotePort = remotePort;
    LocalPort = localPort;

    EnableMulticast = enableMulticast;
    MulticastAddress = multicastAddress;
    socketsOpen = false;
  }

  ~UDPPacketIO() {
    // latest time for this socket to be closed
    if (IsOpen()) {
      BobRemoteControl.BobDebug.Log("closing udpclient listener on port " + localPort);
      Close();
```

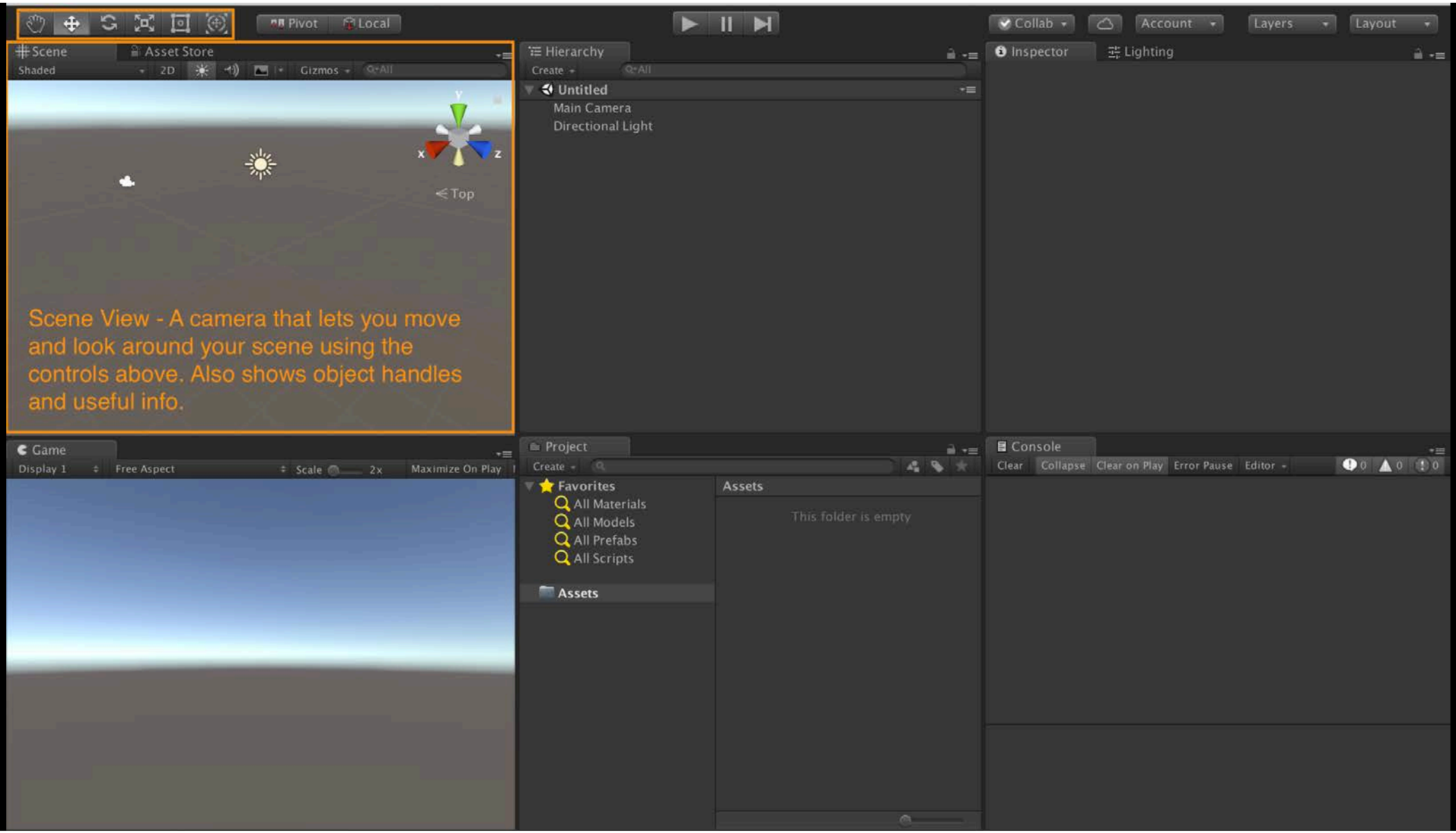

Compiler

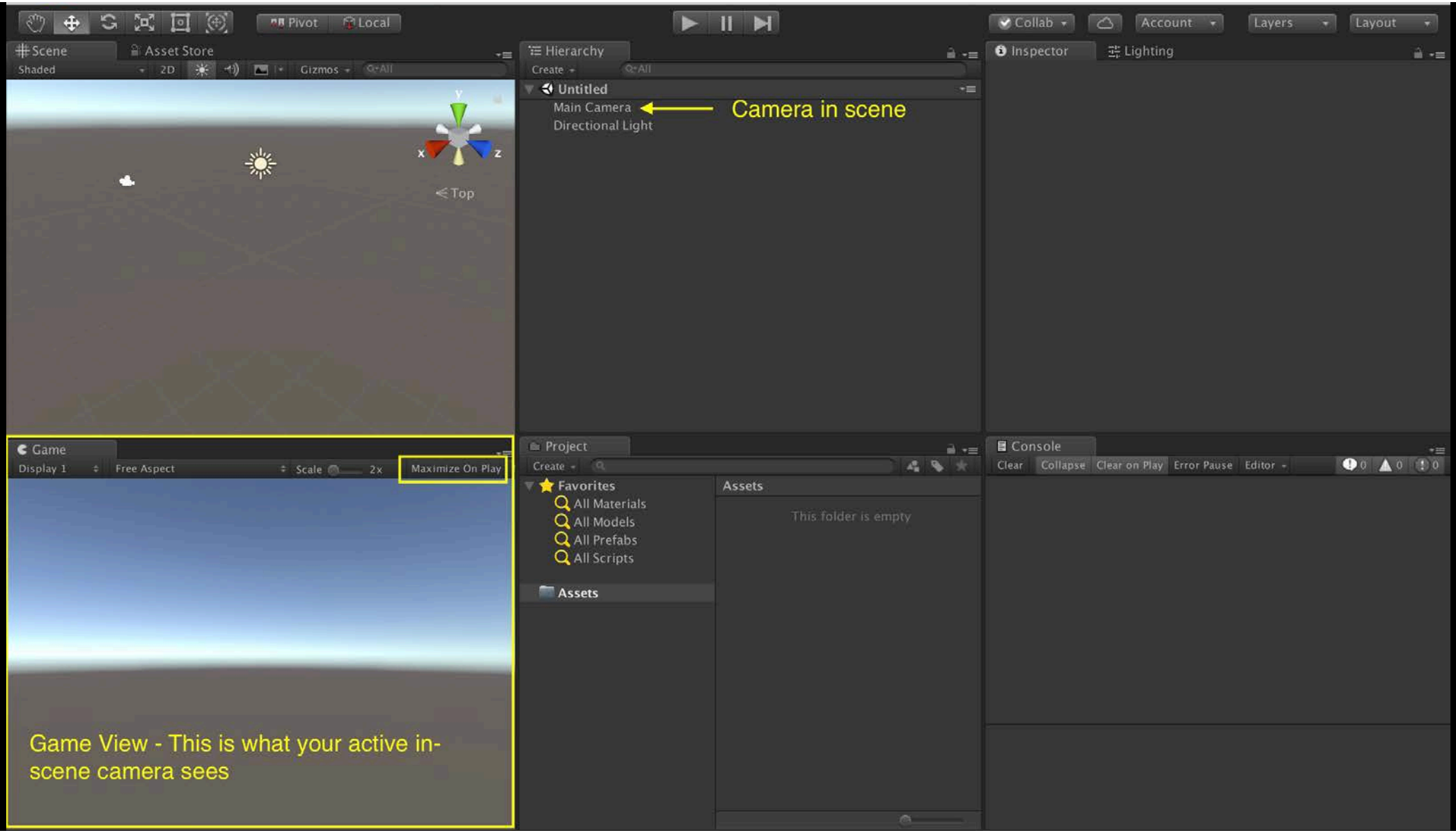
```
b8 00 b8 8e c0 8d 36 20 03 e8 fd 01 bf a2 00 b9
02 00 eb 2b b4 06 b2 ff cd 21 3c 71 0f 84 e5 01
3c 50 b9 a0 00 74 18 3c 48 b9 a0 00 0f 84 d9 00
b9 02 00 3c 4d 74 08 3c 4b 0f 84 cc 00 eb d5 89
3e b5 09 01 cf 89 3e b3 09 e8 87 01 8b 3e b5 09
b0 20 26 88 05 26 88 45 fe 26 88 85 62 ff 26 88
85 60 ff 26 88 85 5e ff 26 88 85 9e 00 b0 07 26
88 45 01 8b 3e b3 09 89 fb 83 eb 02 d1 fb 8a 00
26 88 45 fe 89 fb 81 eb a2 00 d1 fb 8a 00 26 88
85 5e ff 89 fb 81 eb a0 00 d1 fb 8a 00 26 88 85
60 ff 89 fb 81 eb 9e 00 d1 fb 8a 00 26 88 85 62
ff 89 fb 81 eb a2 00 d1 fb 8a 00 26 88 85 5e ff
89 fb 83 c3 02 d1 fb 8a 00 26 88 45 02 89 fb 81
c3 9e 00 d1 fb 8a 00 26 88 85 9e 00 89 fb 81 c3
a0 00 d1 fb 8a 00 26 88 85 a0 00 89 fb 81 c3 a2
00 d1 fb 8a 00 26 88 85 a2 00 b0 03 26 88 05 a0
b7 09 26 88 45 01 e9 0b ff 89 3e b5 09 29 cf 89
3e b3 09 e8 bd 00 8b 3e b5 09 b0 20 26 88 05 26
88 45 02 26 88 85 9e 00 26 88 85 a0 00 26 88 85
a2 00 26 88 85 62 ff b0 07 26 88 45 01 8b 3e b3
09 89 fb 83 eb 02 d1 fb 8a 00 26 88 45 fe 89 fb
81 eb a2 00 d1 fb 8a 00 26 88 85 5e ff 89 fb 81
eb a0 00 d1 fb 8a 00 26 88 85 60 ff 89 fb 81 eb
9e 00 d1 fb 8a 00 26 88 85 62 ff 89 fb 81 eb a2
00 d1 fb 8a 00 26 88 85 5e ff 89 fb 83 c3 02 d1
```

Visual Studio


unity


Pivot
Local
Collab
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Hierarchy
Create
Untitled
Main Camera
Directional Light
Inspector
Lighting
Top
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
Local
Collab
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Top
Scene View - A camera that lets you move and look around your scene using the controls above. Also shows object handles and useful info.
Hierarchy
Create
Untitled
Main Camera
Directional Light
Inspector
Lighting
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
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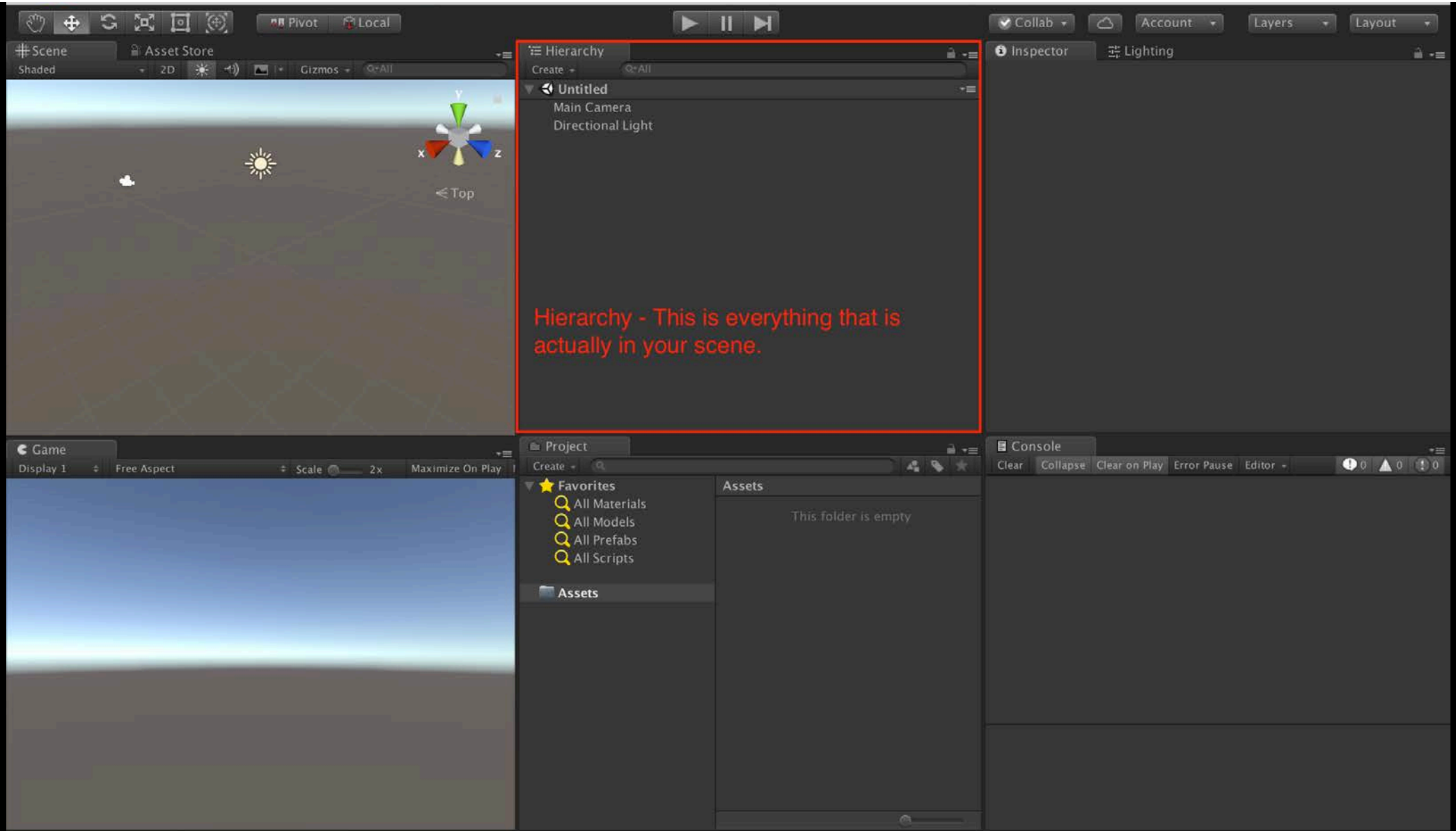
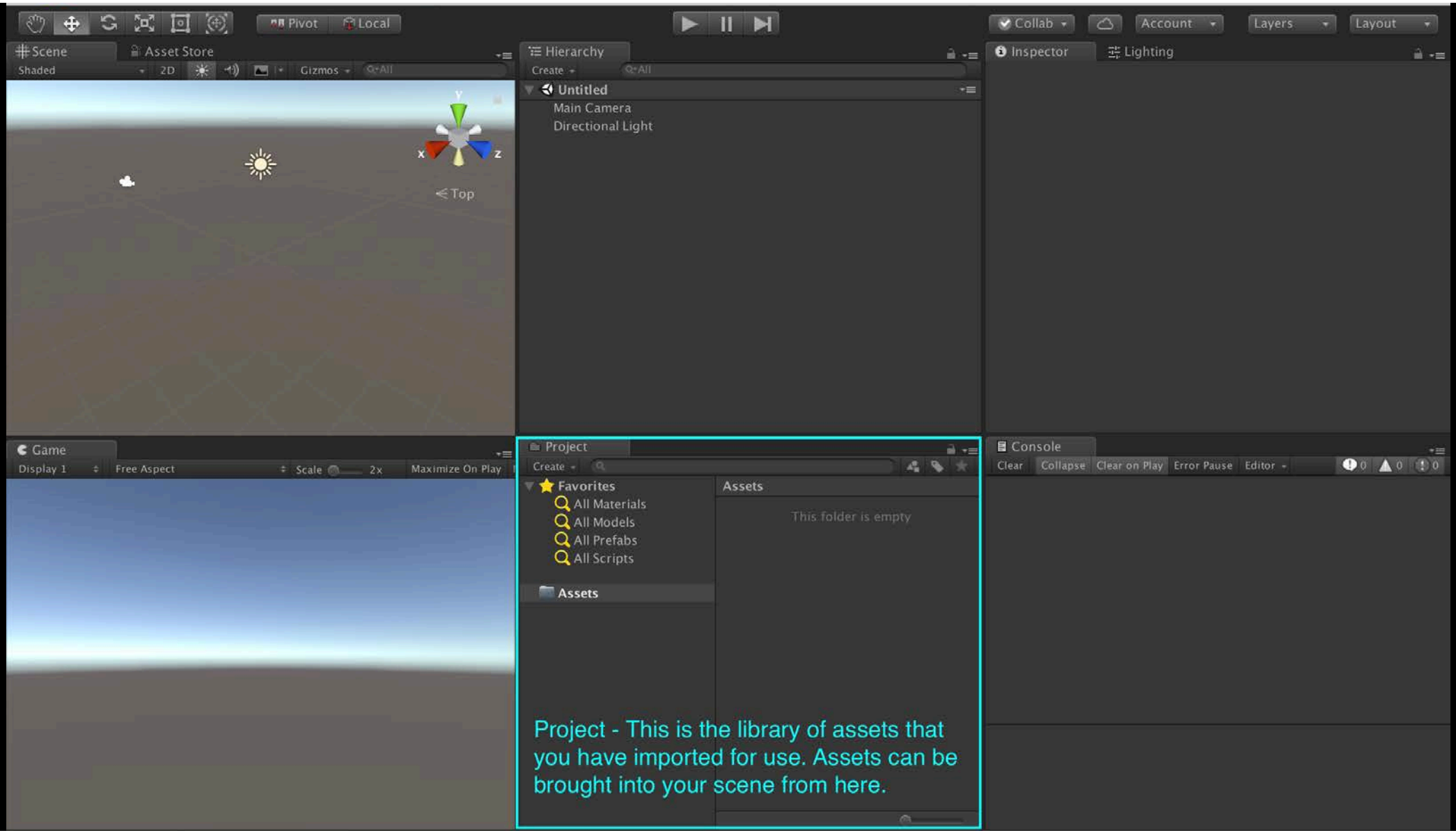
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Hierarchy
Create
Untitled
Main Camera
Directional Light
Camera in scene
Inspector
Lighting
Top
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
Game View - This is what your active in-scene camera sees


Pivot
Local
Collab
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Top
Hierarchy
Create
Untitled
Main Camera
Directional Light
Hierarchy - This is everything that is actually in your scene.
Inspector
Lighting
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
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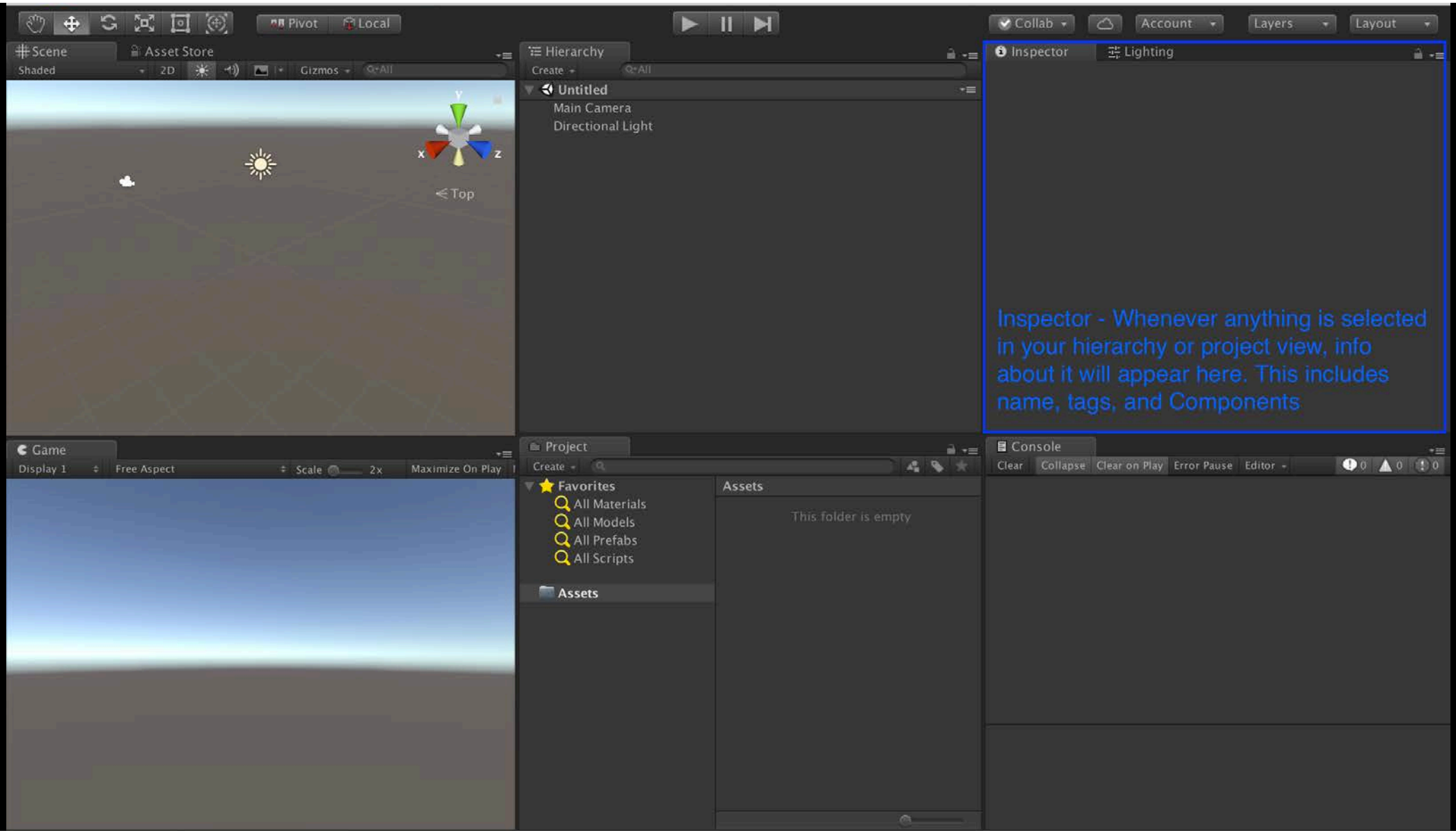
Gizmos
Hierarchy
Create
Untitled
Main Camera
Directional Light
Inspector
Lighting
Top
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
Project - This is the library of assets that you have imported for use. Assets can be brought into your scene from here.


Pivot
Local
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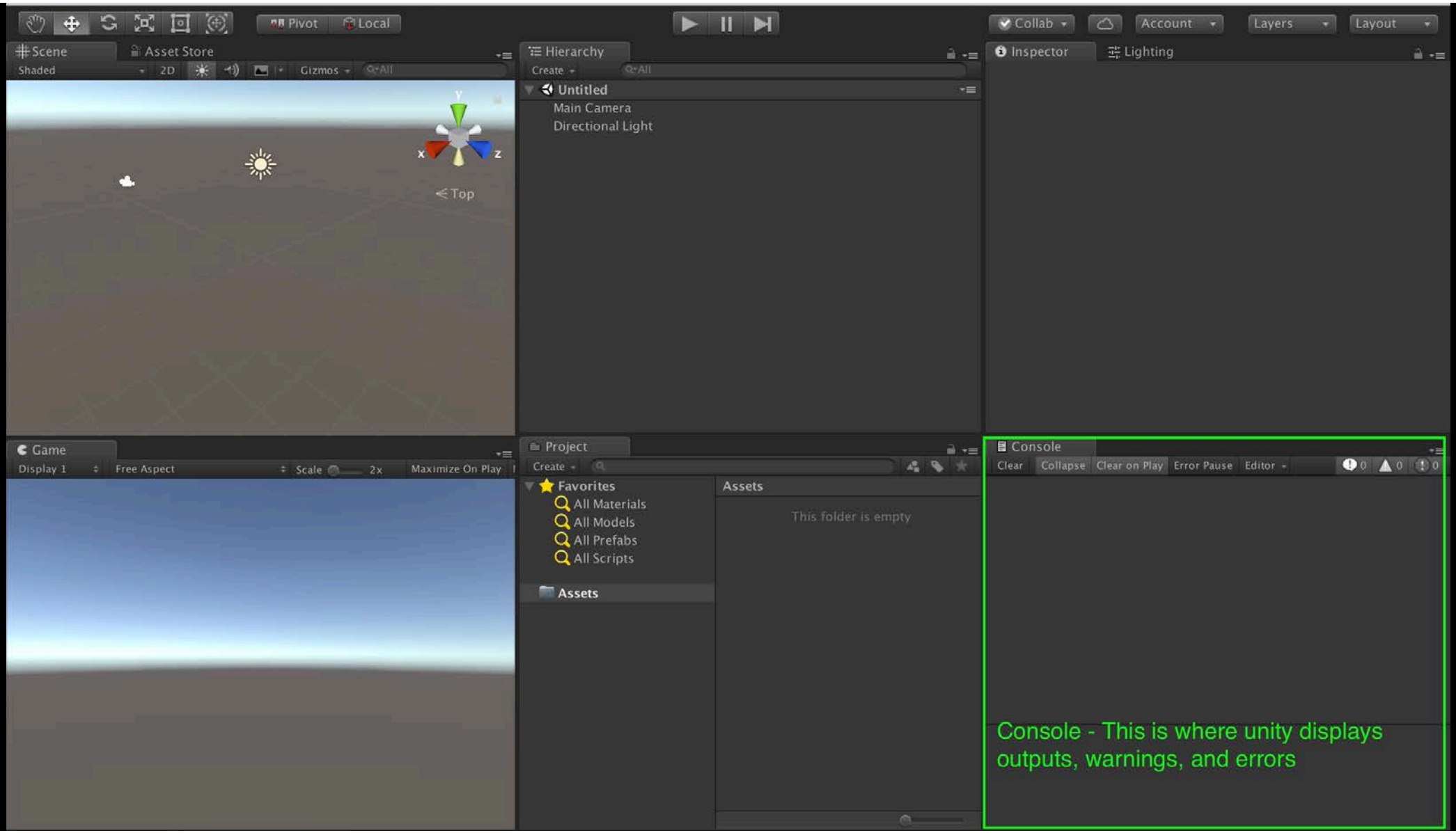
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Hierarchy
Create
Untitled
Main Camera
Directional Light
Inspector
Lighting
Top
Inspector - Whenever anything is selected in your hierarchy or project view, info about it will appear here. This includes name, tags, and Components
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
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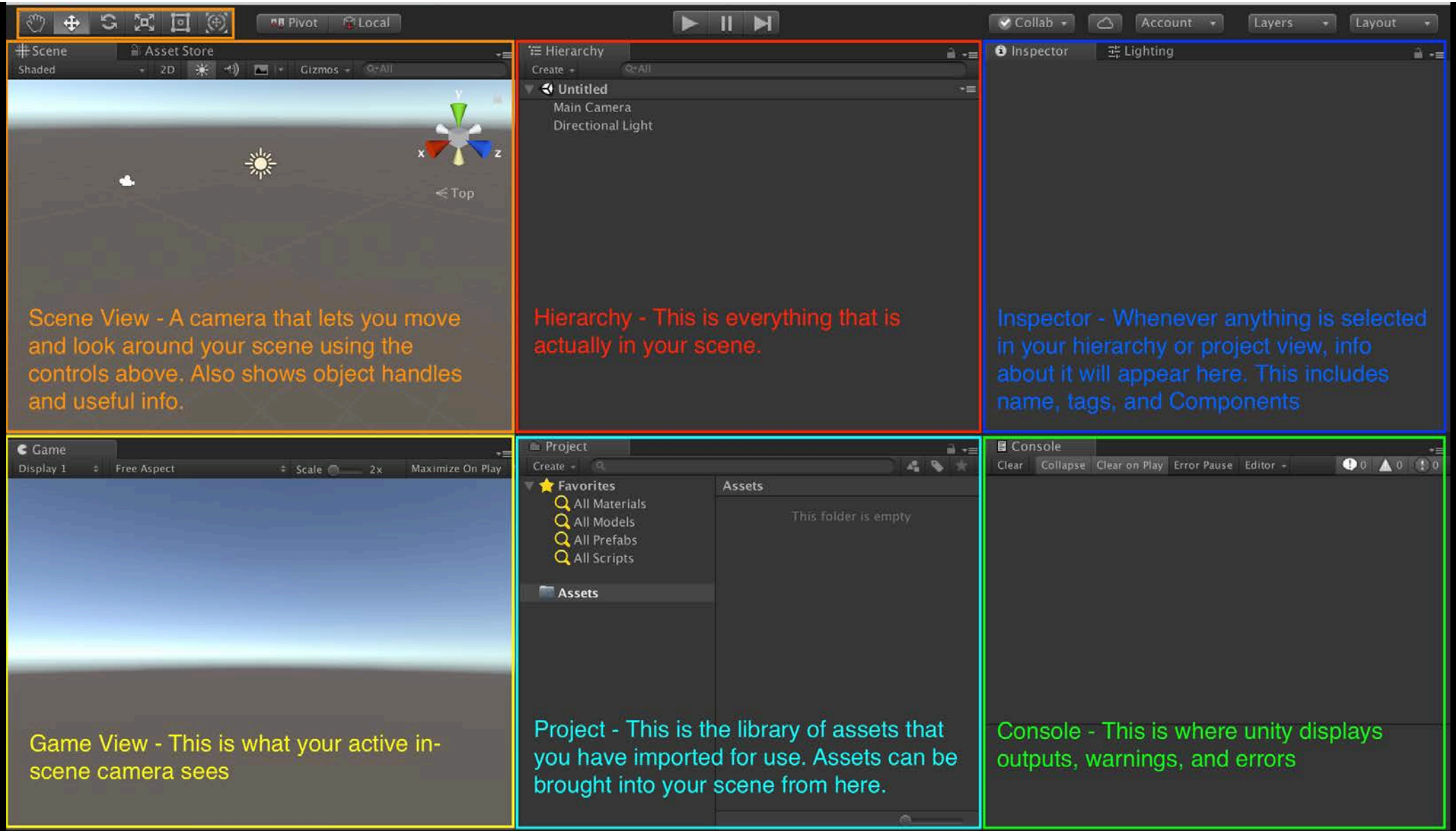
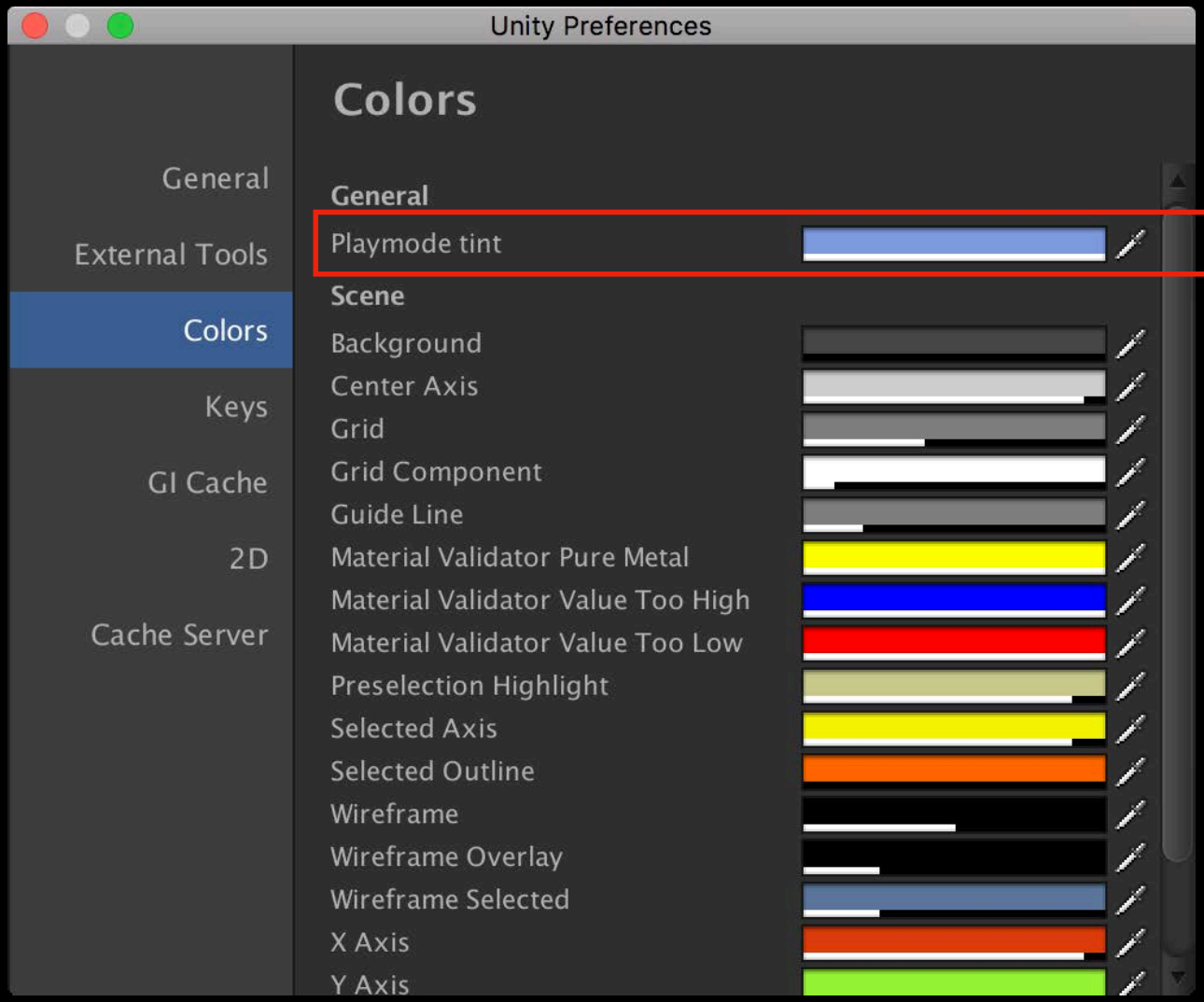
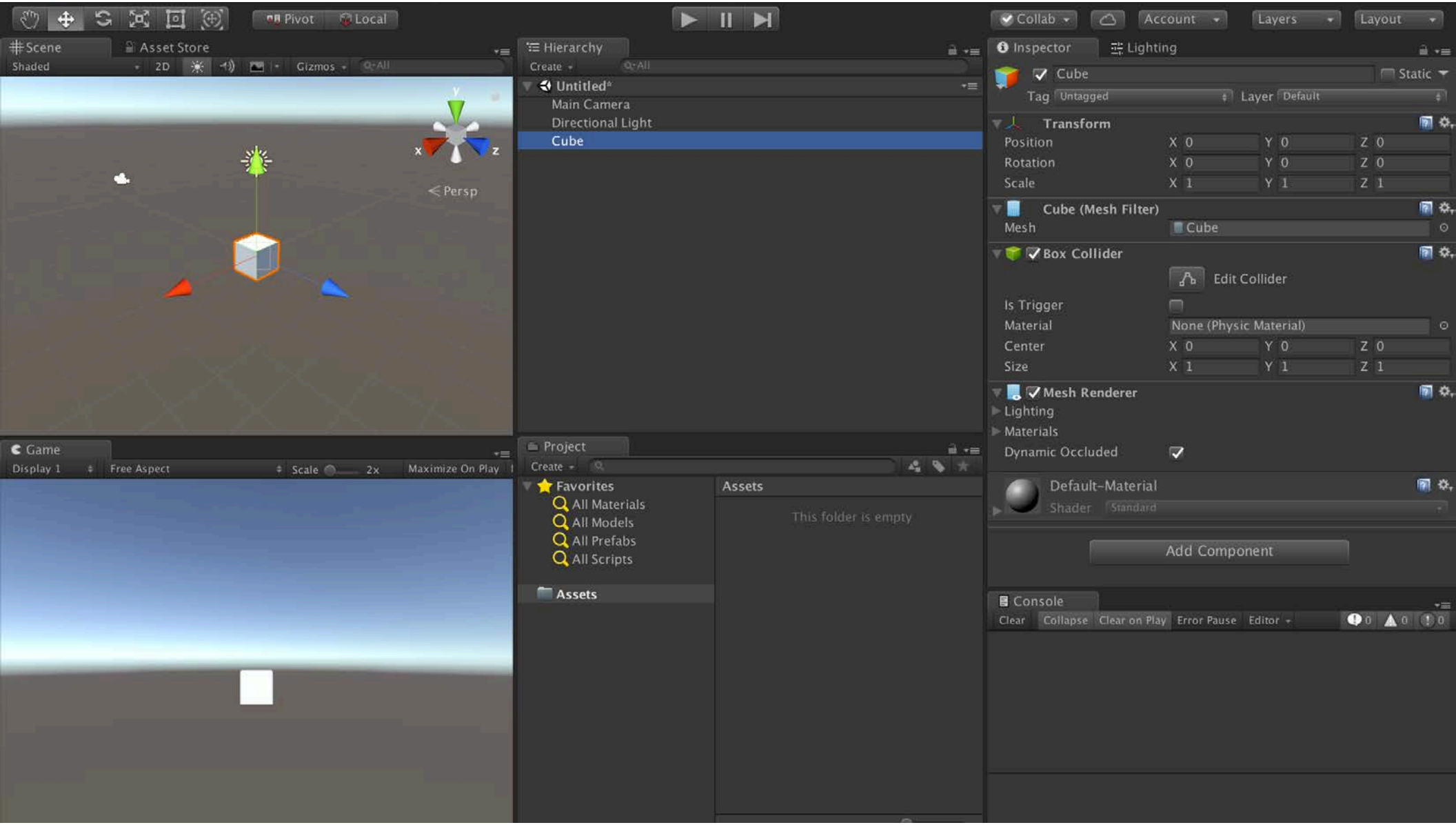
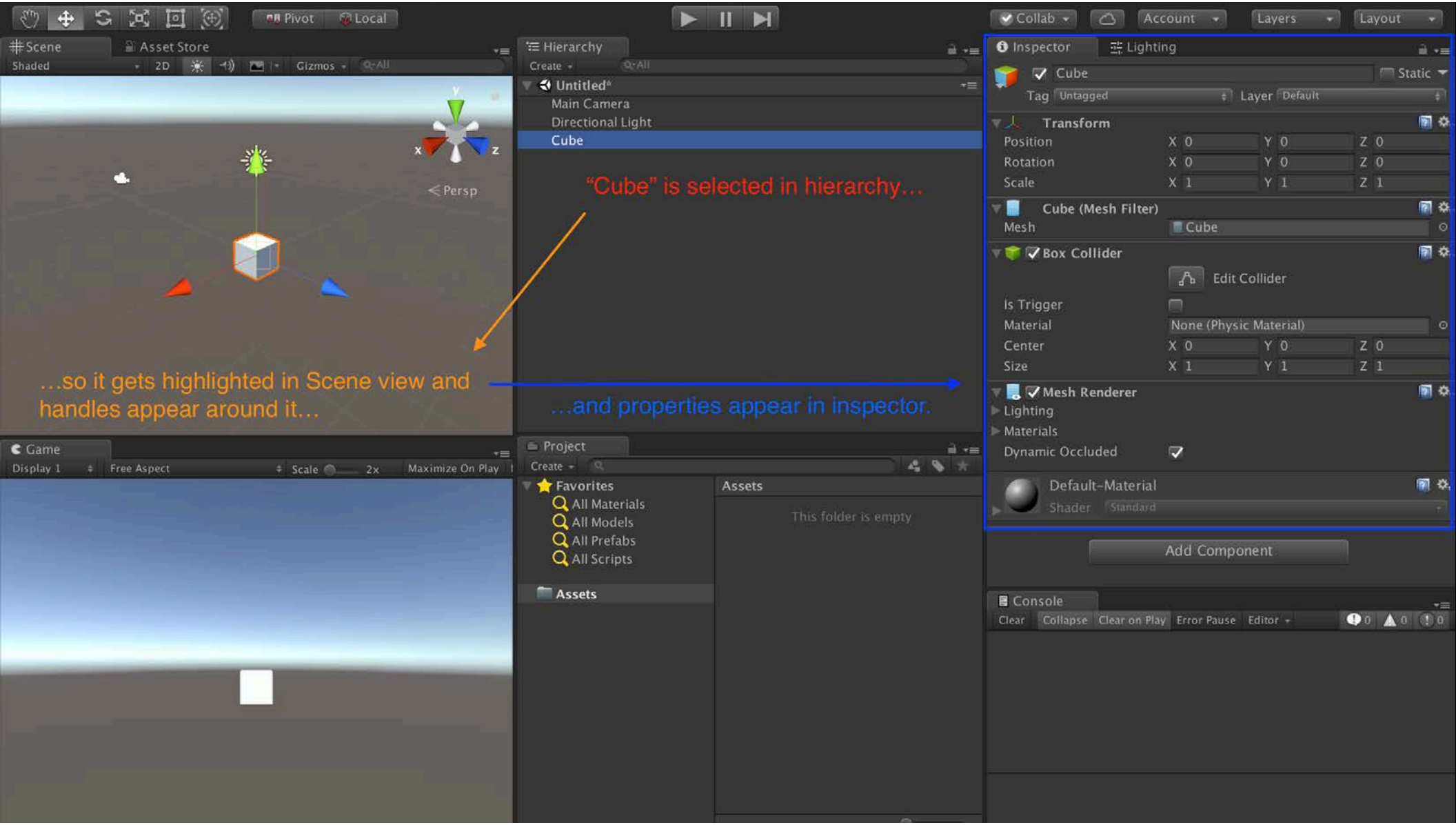
Asset Store
Shaded
2D
Gizmos
Hierarchy
Create
Untitled
Main Camera
Directional Light
Inspector
Lighting
Top
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
Console - This is where unity displays outputs, warnings, and errors


Pivot
Local
Collab
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Top
Scene View - A camera that lets you move and look around your scene using the controls above. Also shows object handles and useful info.
Hierarchy
Create
Untitled
Main Camera
Directional Light
Hierarchy - This is everything that is actually in your scene.
Inspector
Lighting
Inspector - Whenever anything is selected in your hierarchy or project view, info about it will appear here. This includes name, tags, and Components
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Game View - This is what your active in-scene camera sees
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Project - This is the library of assets that you have imported for use. Assets can be brought into your scene from here.
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
Console - This is where unity displays outputs, warnings, and errors



Make sure to enable Playmode Tint!


Pivot
Local
Collab
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Persp
Hierarchy
Create
Untitled*
Main Camera
Directional Light
Cube
Inspector
Lighting
Cube
Static
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
Cube (Mesh Filter)
Mesh
Box Collider
Edit Collider
Is Trigger
Material
None (Physic Material)
Center
Size
Mesh Renderer
Lighting
Materials
Dynamic Occluded
Default-Material
Shader
Standard
Add Component
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
Local
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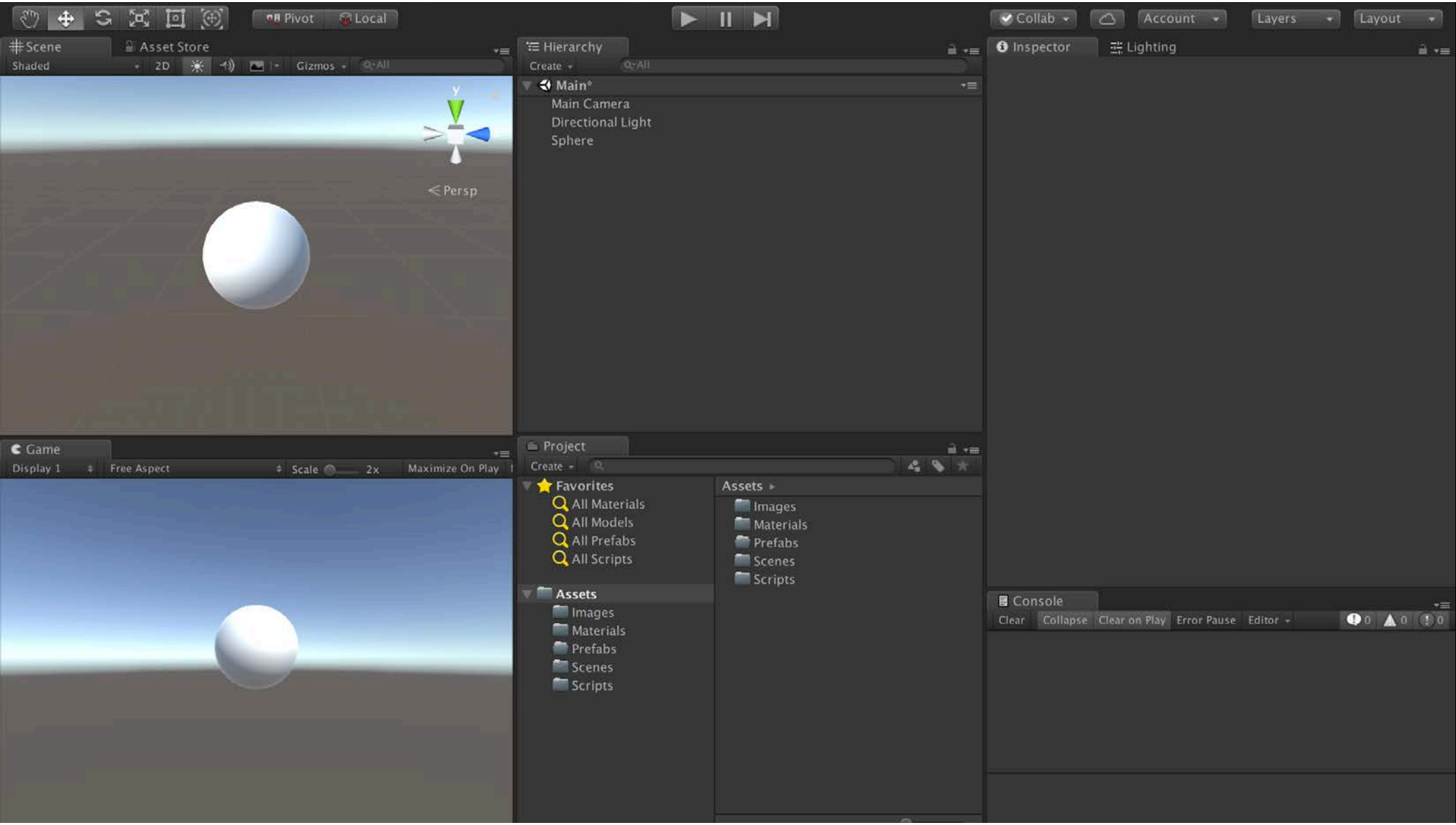
Account
Layers
Layout
Scene
Asset Store
Shaded
2D
Gizmos
Persp
Hierarchy
Create
Untitled*
Main Camera
Directional Light
Cube
"Cube" is selected in hierarchy…
…so it gets highlighted in Scene view and handles appear around it…
…and properties appear in inspector.
Inspector
Lighting
Cube
Static
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
Cube (Mesh Filter)
Mesh
Box Collider
Edit Collider
Is Trigger
Material
None (Physic Material)
Center
Size
Mesh Renderer
Lighting
Materials
Dynamic Occluded
Default-Material
Shader
Standard
Add Component
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Create
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
This folder is empty
Console
Clear
Collapse
Clear on Play
Error Pause
Editor


Pivot
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Gizmos
Persp
Hierarchy
Create
Main*
Main Camera
Directional Light
Sphere
Inspector
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Game
Display 1
Free Aspect
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Maximize On Play
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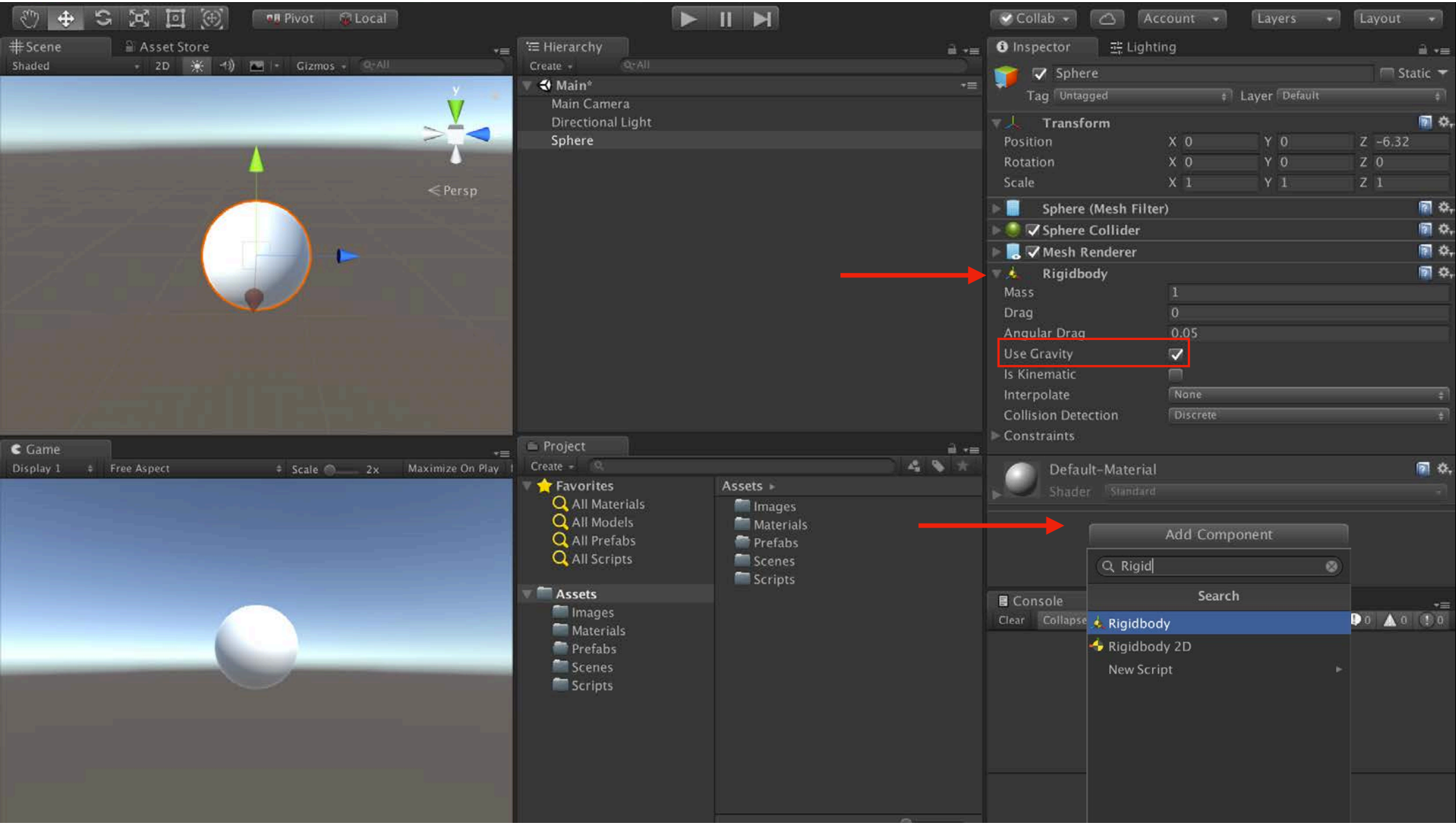
Console
Clear
Collapse
Clear on Play
Error Pause
Editor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2D
Gizmos
Persp
Hierarchy
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Main*
Main Camera
Directional Light
Sphere
Inspector
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Sphere
Static
Tag
Untagged
Layer
Default
Transform
Position
Rotation
Scale
Sphere (Mesh Filter)
Sphere Collider
Mesh Renderer
Rigidbody
Mass
Drag
Angular Drag
Use Gravity
Is Kinematic
Interpolate
None
Collision Detection
Discrete
Constraints
Default-Material
Shader
Standard
Add Component
Rigid
Search
Rigidbody
Rigidbody 2D
New Script
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
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Favorites
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All Scripts
Assets
Images
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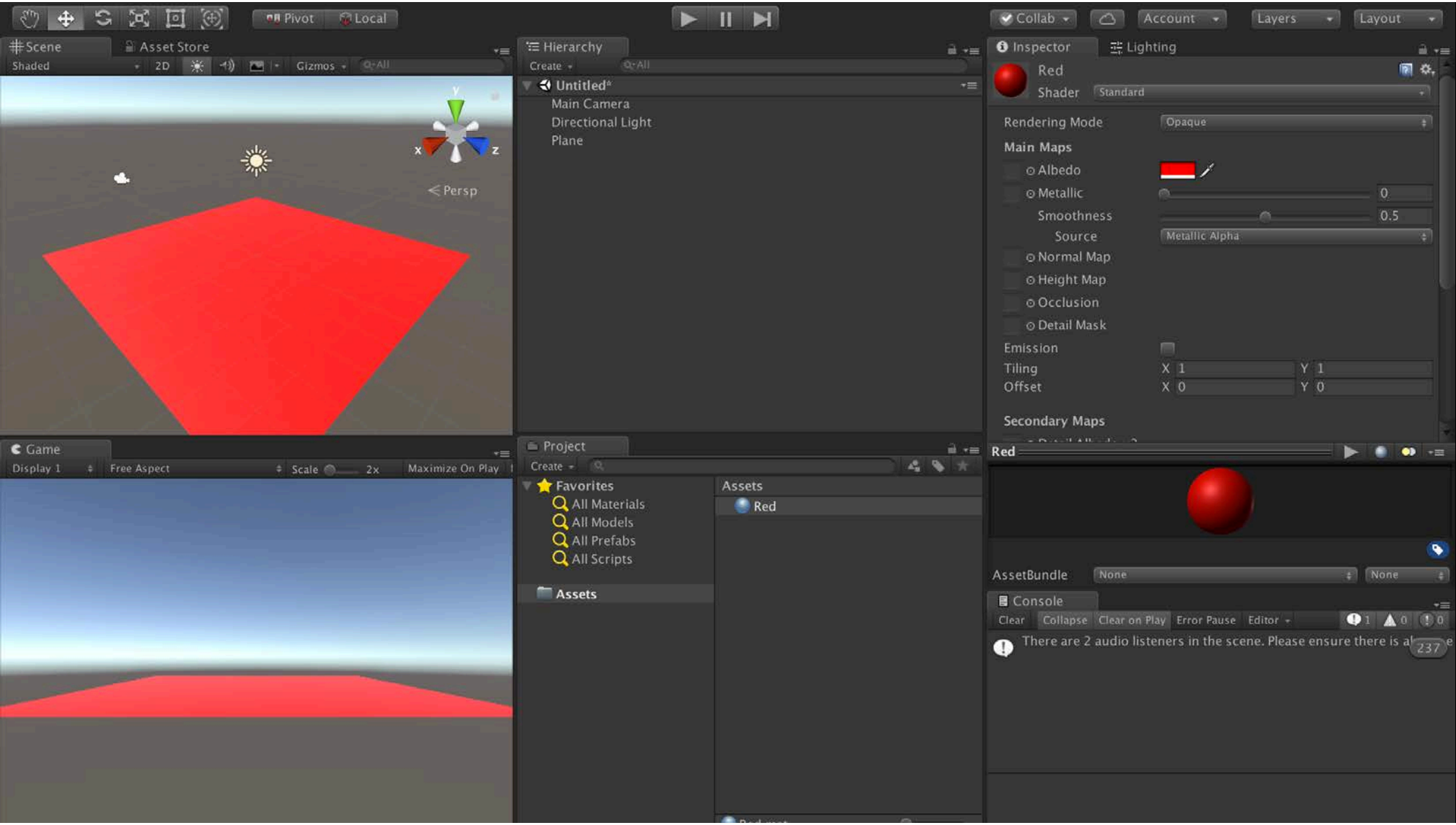
Prefabs
Scenes
Scripts
Console
Clear
Collapse


Pivot
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Create
Untitled*
Main Camera
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Red
Shader
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Rendering Mode
Opaque
Main Maps
Albedo
Metallic
Smoothness
Source
Metallic Alpha
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Height Map
Occlusion
Detail Mask
Emission
Tiling
Offset
Secondary Maps
Game
Display 1
Free Aspect
Scale
2x
Maximize On Play
Project
Favorites
All Materials
All Models
All Prefabs
All Scripts
Assets
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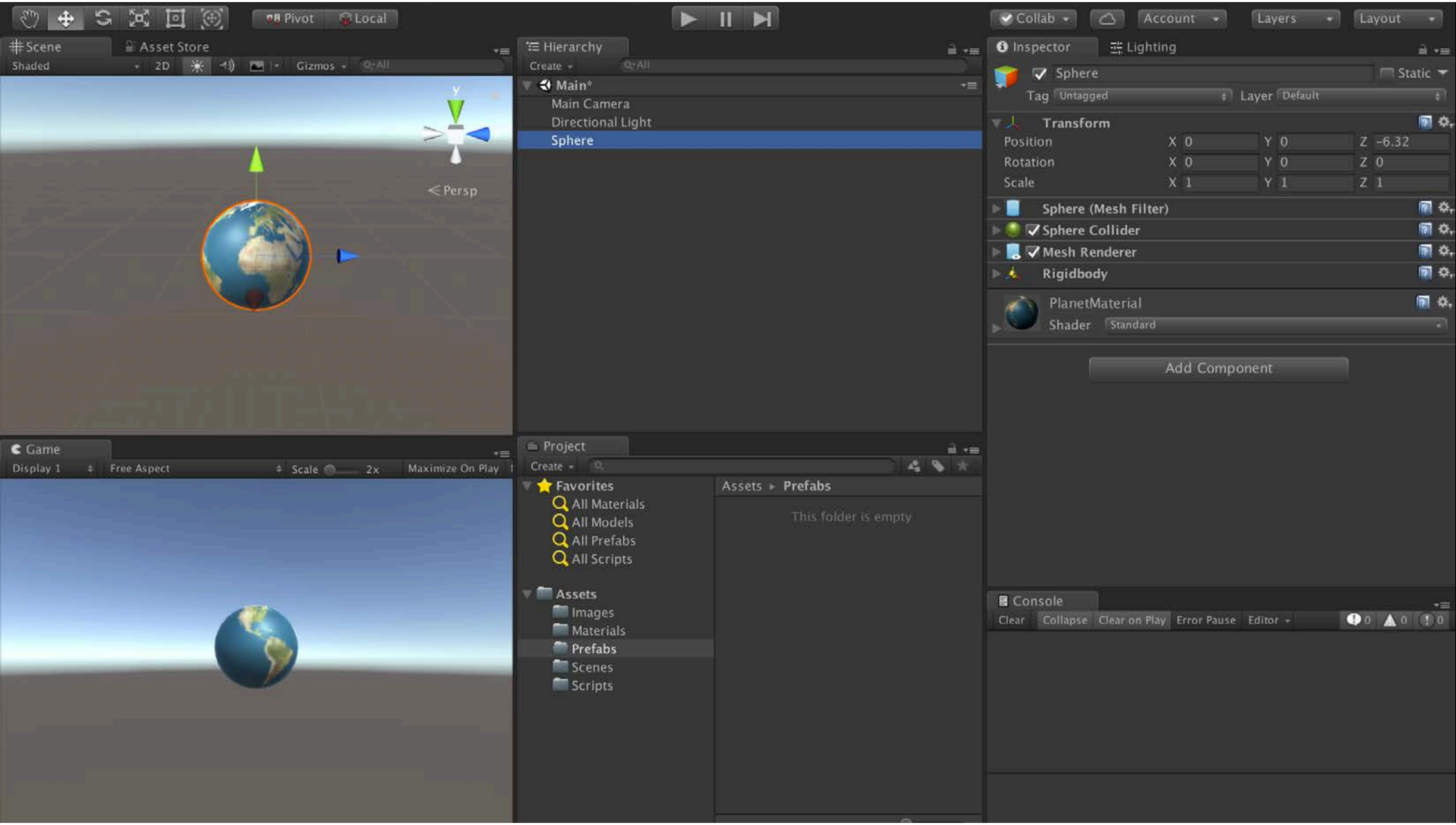
AssetBundle
None
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
There are 2 audio listeners in the scene. Please ensure there is al
237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Sphere (Mesh Filter)
Sphere Collider
Mesh Renderer
Rigidbody
PlanetMaterial
Shader
Standard
Add Component
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Display 1
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Maximize On Play
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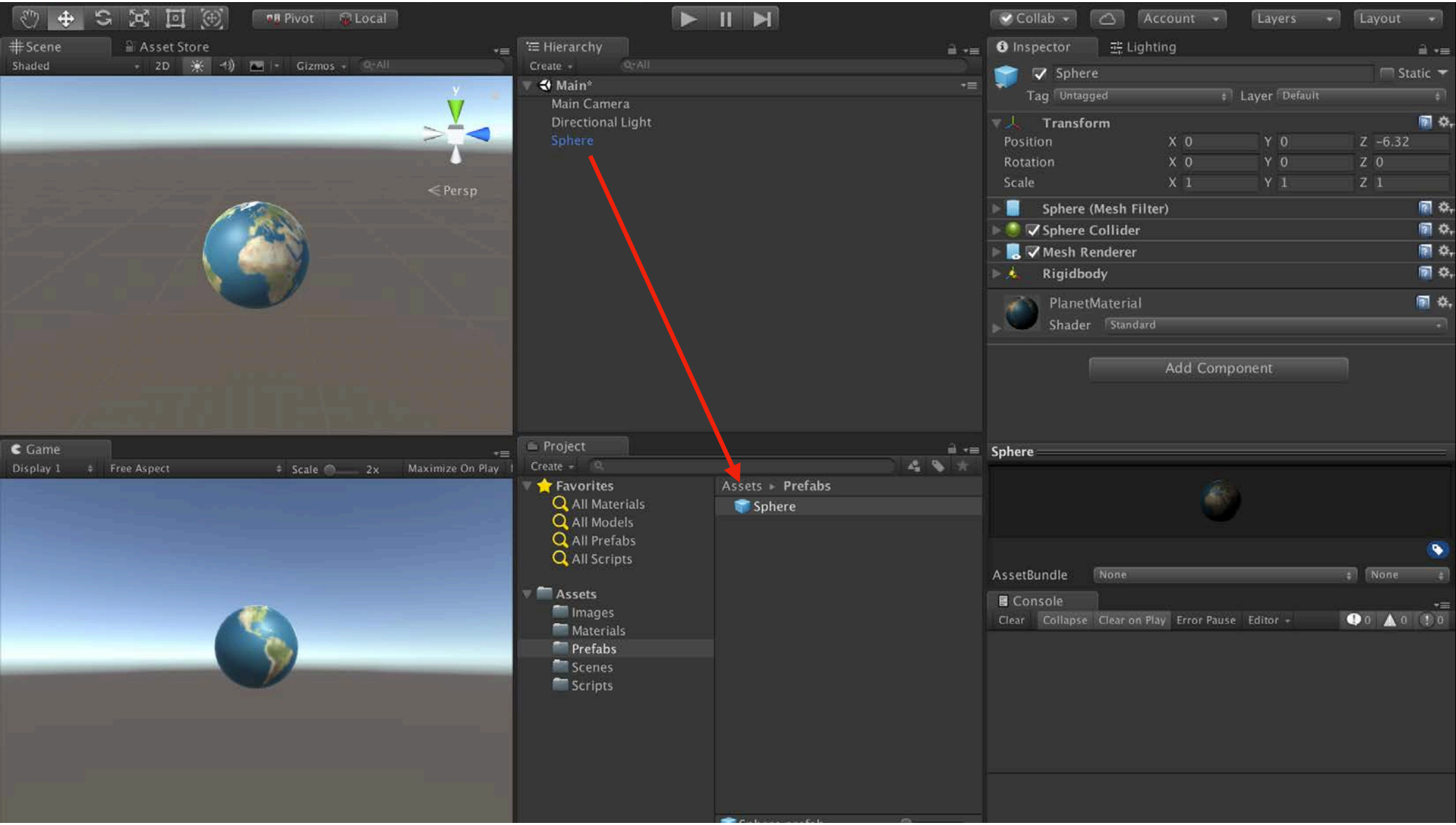
Collapse
Clear on Play
Error Pause
Editor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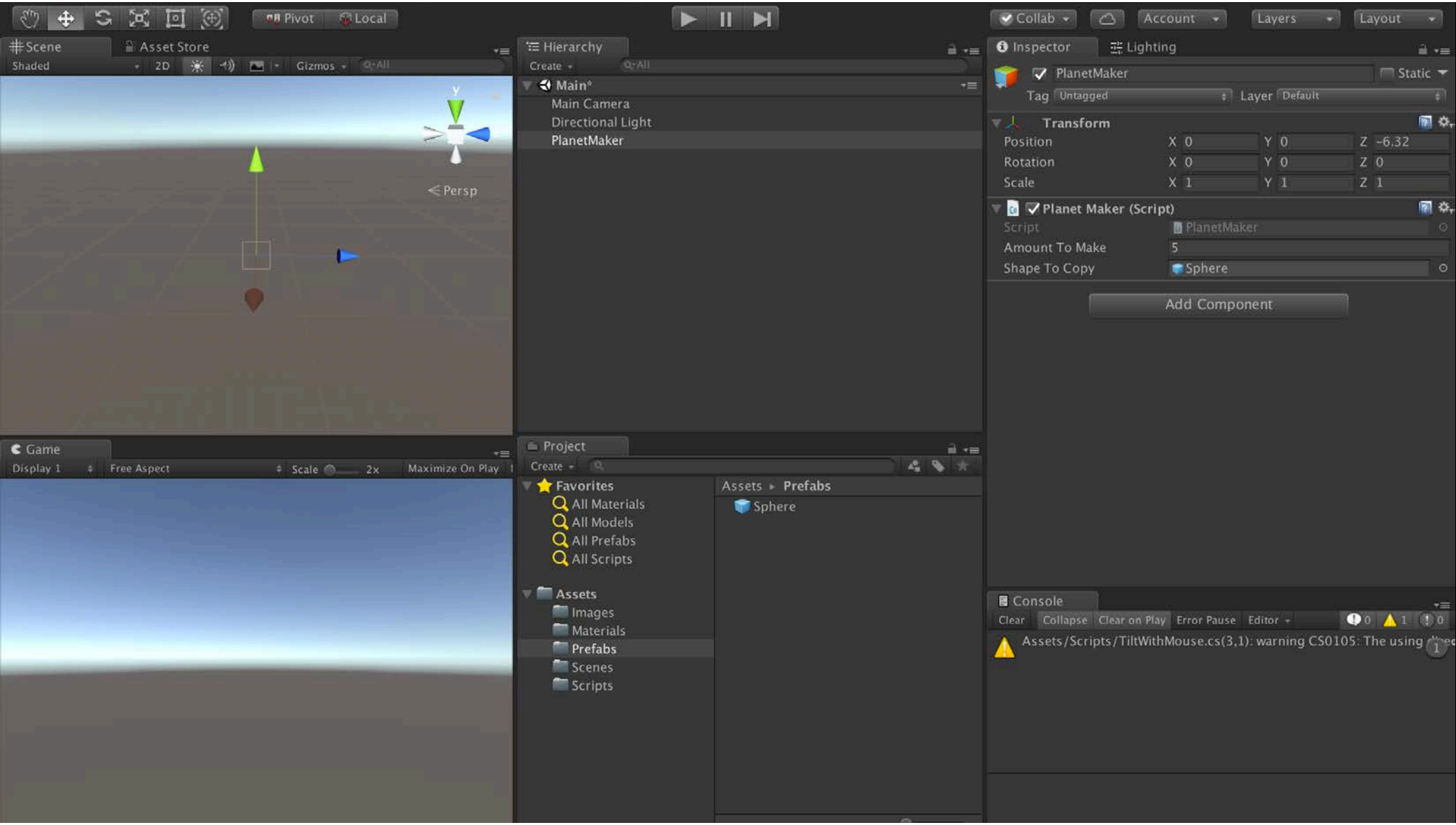
Collapse
Clear on Play
Error Pause
Editor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Directional Light
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PlanetMaker
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Untagged
Layer
Default
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Position
Rotation
Scale
Planet Maker (Script)
Script
Amount To Make
Shape To Copy
Sphere
Add Component
Game
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Free Aspect
Scale
2x
Maximize On Play
Project
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Prefabs
Scenes
Scripts
Assets ▸ Prefabs
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Console
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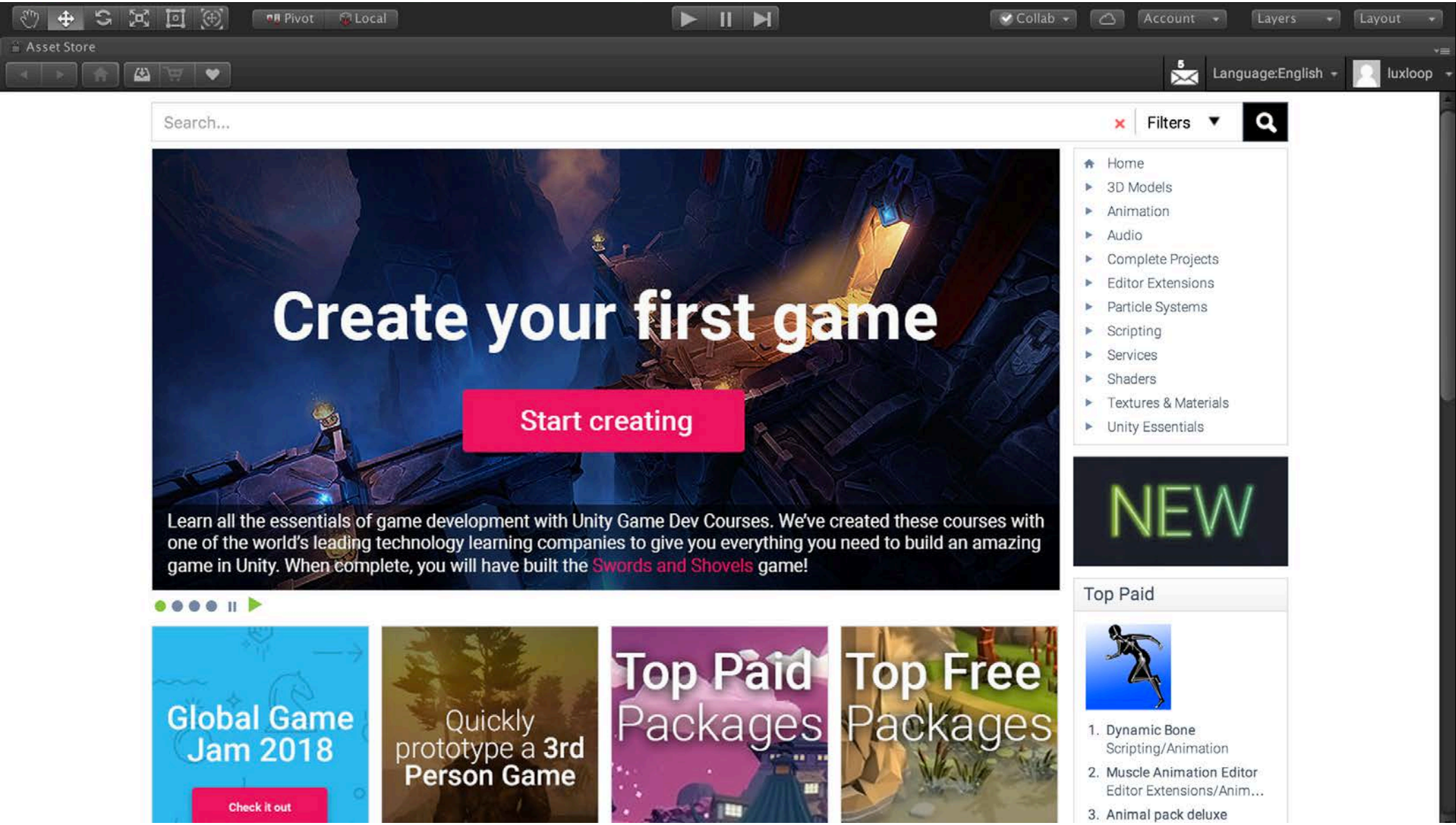
Collapse
Clear on Play
Error Pause
Editor
Assets/Scripts/TiltWithMouse.cs(3,1): warning CS0105: The using


Pivot
Local
Collab
Account
Layers
Layout
Asset Store
Language:English
luxloop
Search...
Filters
Create your first game
Start creating
Learn all the essentials of game development with Unity Game Dev Courses. We've created these courses with one of the world's leading technology learning companies to give you everything you need to build an amazing game in Unity. When complete, you will have built the Swords and Shovels game!
Home
3D Models
Animation
Audio
Complete Projects
Editor Extensions
Particle Systems
Scripting
Services
Shaders
Textures & Materials
Unity Essentials
NEW
Top Paid
1. Dynamic Bone
Scripting/Animation
2. Muscle Animation Editor
Editor Extensions/Anim...
3. Animal pack deluxe
Global Game Jam 2018
Check it out
Quickly prototype a 3rd Person Game
Top Paid Packages
Top Free Packages

Pivot Local Collab Account Layers Layout

Asset Store

5 Language:English luxloop

Standard × Assets × Filters

MAXIMUM PRICE $

FREE 5 10 20 50 100 200 ∞

FREE ONLY PAID ONLY

MINIMUM RATING

SUPPORTED UNITY VERSION

<- 2017.3.0 e.g. 5.2.0

PACKAGES ONLY LISTS ONLY

MAXIMUM SIZE MB

1MB 5MB 50MB 100MB 250MB 500MB 1GB 4GB

RELEASED days ago

1d 7d 14d 1m 3m 6m 1y 5y

UPDATED days ago

1d 7d 14d 1m 3m 6m 1y 5y

- Home
- 3D Models
- Animation
- Audio
- Complete Projects
- Editor Extensions
- Particle Systems
- Scripting
- Services
- Shaders
- Textures & Materials
- Unity Essentials

SORT BY **RELEVANCE** / POPULARITY / NAME / PRICE / RATING / UPDATED

1 2 3 4 5 6 7 8 9 10 Next Last 1 - 36 of 1630

Standard Assets
Unity Essentials/A...
Unity Technologies
★★★★★ (3137)
FREE

Standard Assets f...
Unity Essentials/A...
Unity Technologies
★★★★ (1246)
FREE

Assets_Kitchenroom
3D Models/Enviro...
Argyle Co.,Ltd
Not enough ratings
$18.00

Assets_classroom
3D Models/Enviro...
Argyle Co.,Ltd
Not enough ratings
$24.00

Standard Scooter
3D Models/Vehicl...
Virtualware
★★★ (3)
$2.00

Assets_School_Ha...
3D Models/Enviro...
Argyle Co.,Ltd
Not enough ratings
$10.00

[Affordable Assets...
3D Models/Props/...
Creation Wasteland
Not enough ratings
$5.99

Grab Yer Assets
Editor Extensions/...
Xeir
★★★★★ (71)
$49.00

Graveyard Assets ...
3D Models/Enviro...
Kittens and Elves ...
Not enough ratings
$5.00

World Creator Sta...

Color Mask Stand...

10+1 Standard M...

Top Paid

1. Dynamic Bone
   Scripting/Animation
2. Muscle Animation Editor
   Editor Extensions/Anim...
3. Animal pack deluxe

Pivot Local Collab Account Layers Layout

Asset Store

5 Language:English luxloop

Filters

Standard Assets

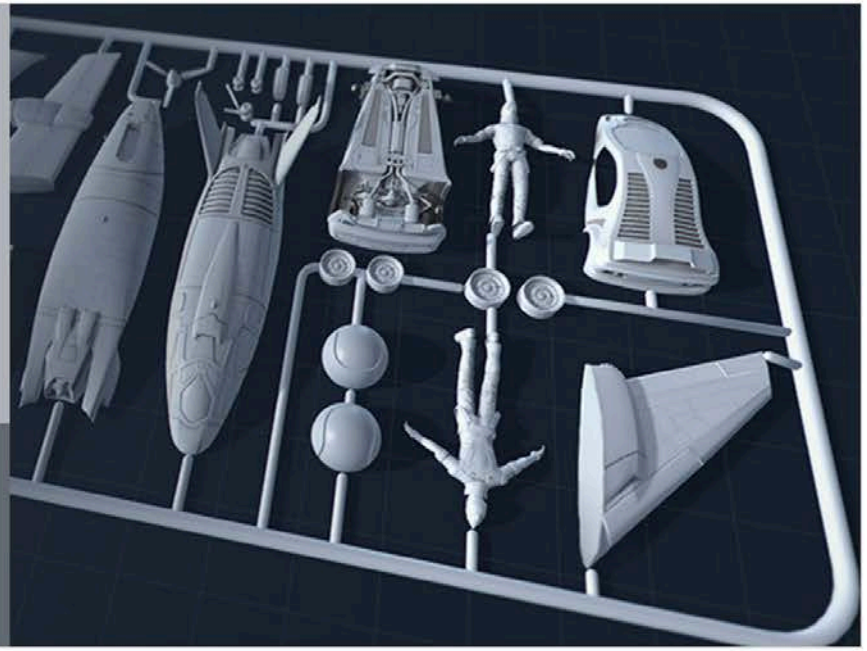
Unity Essentials/Asset Packs

Unity Technologies

★★★★★ (3137)

FREE

Update



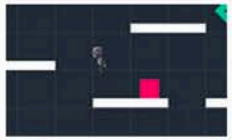
This collection of assets, scripts, and example scenes can be used to kickstart your Unity learning or be used as the basis for your own projects.

The package includes:

First Person Character Controller
Third Person Character Controller







Version: 1.1.4 (Jan 03, 2018) Size: 191.8 MB Support E-mail Support Website Visit Publisher's Website

Originally released: 16 March 2015

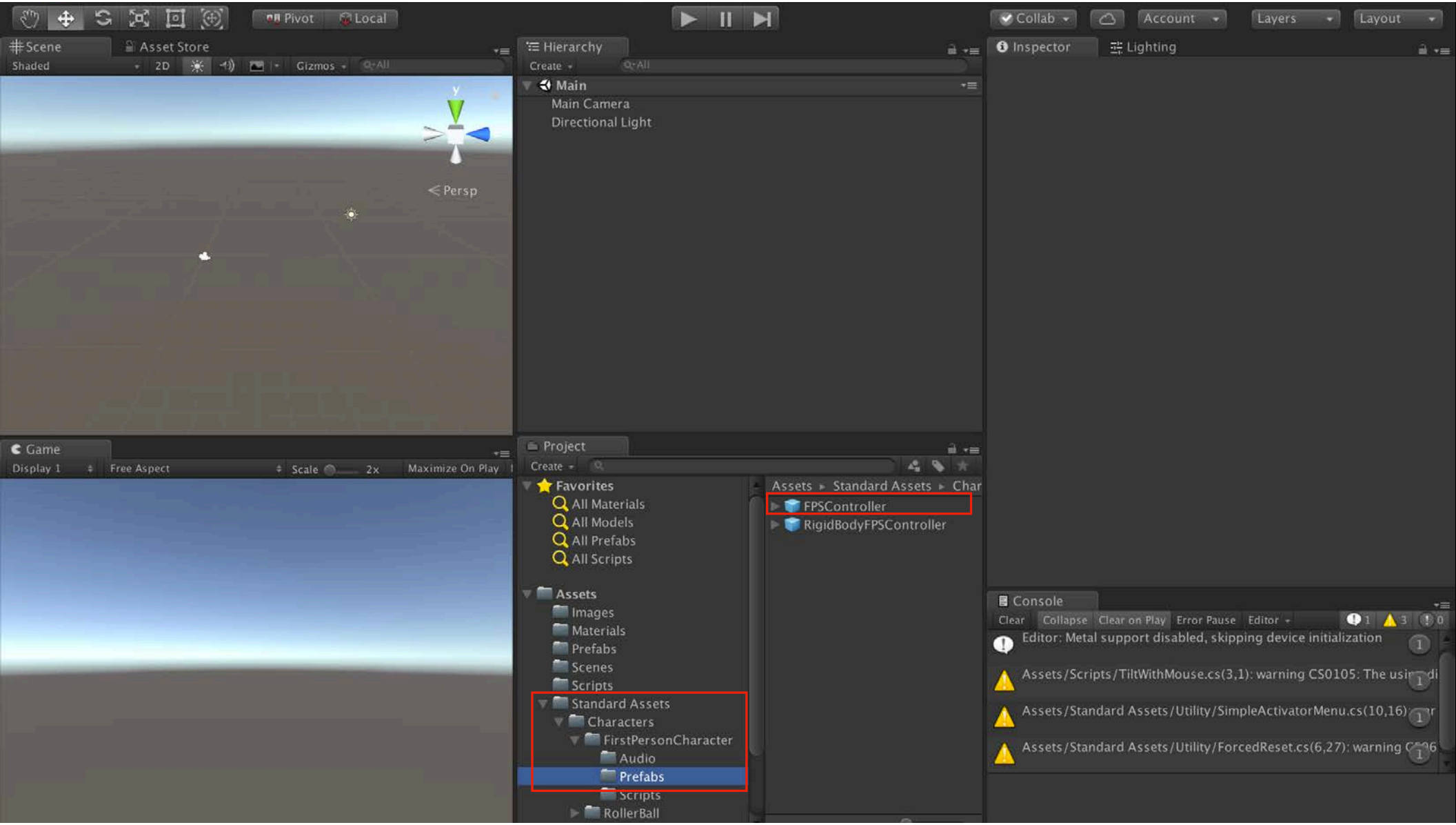
Package has been submitted using Unity 5.0.0, 5.1.4, 5.2.4, 5.3.1, 5.4.2, 5.5.0, 5.6.0, 2017.1.0, and 2017.3.0 to improve compatibility within the range of these versions of Unity.

- Home
- 3D Models
- Animation
- Audio
- Complete Projects
- Editor Extensions
- Particle Systems
- Scripting
- Services
- Shaders
- Textures & Materials
- Unity Essentials
  - **Asset Packs**
  - Beta Content
  - Certification
  - Sample Projects
  - Other

Top Paid

There are no packages under this category

Top Free


Pivot
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Scene
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Persp
Hierarchy
Create
Main
Main Camera
Directional Light
Inspector
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Display 1
Free Aspect
Scale
2x
Maximize On Play
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All Materials
All Models
All Prefabs
All Scripts
Assets
Images
Materials
Prefabs
Scenes
Scripts
Standard Assets
Characters
FirstPersonCharacter
Audio
Prefabs
Scripts
RollerBall
Assets ▸ Standard Assets ▸ Char
FPSController
RigidBodyFPSController
Console
Clear
Collapse
Clear on Play
Error Pause
Editor
Editor: Metal support disabled, skipping device initialization
Assets/Scripts/TiltWithMouse.cs(3,1): warning CS0105: The usi
Assets/Standard Assets/Utility/SimpleActivatorMenu.cs(10,16)
Assets/Standard Assets/Utility/ForcedReset.cs(6,27): warning


unity
C#

Vectors

In programming terms, you can think of Vectors as a way to store 2, 3, or 4 values in one easy-to-use package:

```
Vector2 someNumbers = new Vector2(1.0, 2.2);
Vector3 someOtherNumbers = new Vector3(5.3, 2.6, 12.0);
Vector4 evenMoreNumbers = new Vector4(7.4, 2.1, 12.0, 9.8);
```

Vectors

We can use vectors to:

- Store multiple numbers in one variable
- Describe the position of something in our world
  - For example: (2.1, 8.9, 7.4) represents the point in space 2.1 units along the X-axis, 8.9 units along the Y-axis, and 7.4 units along the Z-axis.

Vectors

We can use vectors to:

- Describe a direction
  - For example: (0.0, 1.0, 0.0) represents a point 1 unit directly above (along Y) the origin.
  - If we a drew an arrow from the origin to this point, it would point straight up.
  - It doesn't matter how long the Vector is:
    - (0.0, 1.0, 0.0) and (0.0, 5.2, 0.0) are different points, but they both describe the same *direction* (straight up).

Vectors

Unity has some built-in direction shorthands:

```
Vector3 example = Vector3.up;
```

is the same as:

```
Vector3 example = new Vector3(0.0, 1.0, 0.0);
```

Vectors

Other shorthands:

- `Vector3.up` (pointing along Y-axis)
- `Vector3.forward` (pointing along Z-axis)
- `Vector3.right` (pointing along X-axis)
- `Vector3.one` (Equal to (1.0, 1.0, 1.0)

RayCasting

RayCasting is when we shoot an invisible line into our scene to see if we hit something in that direction.

To understand RayCasting, you must understand **Vectors**.

RayCasting

`Physics.Raycast()` is a function built in to Unity. There are many, many different forms it can take. Here is the easiest:

```
Physics.Raycast(Vector3 originOfTheRay, Vector3 directionOfTheRay);
```

All this function actually does is return `true` or `false` to answer “did this Ray hit anything?”

RayCasting

To store information about *what* was hit, and more importantly *where* the hit is in space, we have to do two things:

1. Declare a variable of the type `RaycastHit` to store the information about the hit point.
2. Use a slightly different version of `Physics.Raycast()` to pass the hit info out of it:

```
RaycastHit hitInfoVariable
Physics.Raycast(Vector3 originOfTheRay, Vector3 directionOfTheRay, out hitInfoVariable)
```

RayCasting

So if wanted to Raycast from a GameObject (for example a Vive tracker or the user's headset POV):

We want to shoot a ray from:
gameObject.transform.position

in the direction of:
gameObject.transform.forward

(**gameObject.transform.forward** is the **local Z-axis** of the *object,* which may be different from the *world* Z-axis, which is Vector3.forward)

RayCasting

```
void Update() {
    RaycastHit hit;
    if ( Physics.Raycast(gameObject.transform.position, gameObject.transform.forward, out hit) ) {

        Debug.DrawLine(gameObject.transform.position, hit.point, Color.red);
        Debug.DrawRay(hit.point, hit.normal, Color.green);

    }
}
```

RayCasting

the **hit** variable that stores information about the result of the Raycast has a few useful properties:

hit.point (The coordinates of the collision as a Vector3)

hit.normal (A Vector3 direction that describes the direction coming *straight out* of the face of the hit object)

RayCasting

These visual Debug functions help you see what's going on. They will draw lines in your *Editor*, but never in the actual *Game* view:

```
Debug.DrawLine(Vector3 lineStartCoordinate, Vector3 lineEndCoordinate, Color color);

Debug.DrawRay(Vector3 lineStartCoordinate, Vector3 lineDirection, Color color);
```

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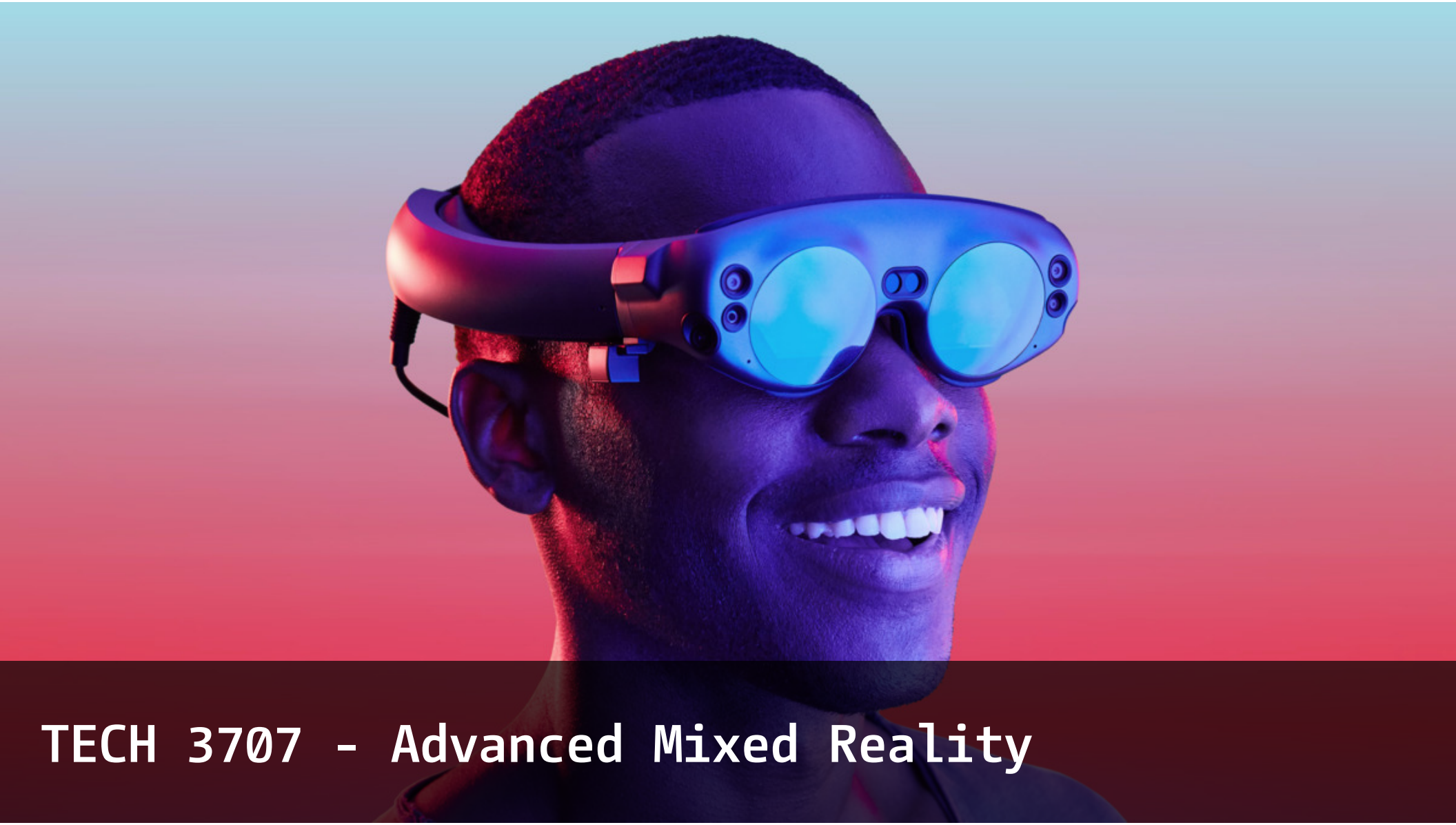

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