Creating Great AR Experiences

Session 805

Grant Paul, Human Interface
Omar Khan, Product Design
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AR
Augmented Reality
Augmented Reality
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Augmented Reality
Augmented Reality
AR Interfaces and Interactions
Getting into AR
Getting into AR

Presenting content
Getting into AR

Presenting content

Interactions in the world
Getting into AR

Presenting content

Interactions in the world
ARKit needs to understand the world
Start moving the device
Show a fixed reference
That's it
Except when it’s not
Use feedback to guide towards success
Match your app’s style
Balance guidance with efficiency
Getting into AR

Presenting content

Interactions in the world
Getting into AR

Presenting content

Interactions in the world
ARKit possibilities
VR
No headset required
THREE YEARS AGO
Content in AR
Keep text readable
Screen Space
Screen Space
Keep text to a minimum
Show details on the display
Transition in and out of AR
Transitions preserve identity
Presenting Content
Presenting Content

ARKit can power 2D experiences
Presenting Content

ARKit can power 2D experiences

VR is a powerful way to show environments
Presenting Content

ARKit can power 2D experiences

VR is a powerful way to show environments

Use screen space text for readable labels
Presenting Content

ARKit can power 2D experiences

VR is a powerful way to show environments

Use screen space text for readable labels

Show details and controls directly on the display
Presenting Content

- ARKit can power 2D experiences
- VR is a powerful way to show environments
- Use screen space text for readable labels
- Show details and controls directly on the display
- Transition smoothly in and out of AR
Getting into AR

Presenting content

Interactions in the world
Getting into AR
Presenting content
Interactions in the world
Touch
Touch enables direct manipulation
AR is physical
Gestures you already know
Direct manipulation isn’t enough
Touch is 2D
Movement is 3D
Moving the device is the primary interaction in AR
<table>
<thead>
<tr>
<th>Name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOUNTAIN LION</td>
<td>2012</td>
</tr>
<tr>
<td>MAVERICKS</td>
<td>2013</td>
</tr>
<tr>
<td>YOSEMITE</td>
<td>2014</td>
</tr>
<tr>
<td>EL CAPITAN</td>
<td>2015</td>
</tr>
<tr>
<td>SIERRA</td>
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</tbody>
</table>
Custom movement interactions
Combine touch and movement
Indirect controls
Focus on content, not your finger
One-handed AR
Getting into AR

Presenting content

Interactions in the world
Getting into AR
Presenting content
Interactions in the world
Creating Great Looking AR Models

Omar Khan, Product Design
Essential concepts
People expect a lot out of AR
Fast and consistent rendering performance
60 Frames Per Second
Minimal battery impact
High fidelity assets and cohesive style
Seamless blend of AR and real world
Leverage AR Quicklook to Preview Assets
Planning the AR experience
Number of objects on screen?
Graphical style and details?
Level of interaction?
Setting up your AR canvas
Campfi
Stylized and playful
Unique details with physically based materials
Working with meshes
Mesh Basics

Vertices
32fps
32fps 955K
High-Density to Low-Density Model
High-Density to Low-Density Model
Producing great looking materials
Physically Based Rendering (PBR)
Albedo
Normals
Metalness
Roughness
Roughness
Roughness
Ambient occlusion
Transparency
Grounding AR content to the real world
Light estimation
Shadows are hard
Environment maps
What's New in ARKit 2

WWDC 2018
The final touches
Things to Keep in Mind

Real world environment considerations
Things to Keep in Mind

Real world environment considerations

Maintaining your rendering budget
Things to Keep in Mind

Real world environment considerations

Maintaining your rendering budget

Leverage the benefits of physically based materials
## Material Property Table

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albedo</td>
<td>Base or diffuse color of the object</td>
</tr>
<tr>
<td>Normals</td>
<td>Adding additional details without modifying base geometry</td>
</tr>
<tr>
<td>Metalness</td>
<td>Determining whether an object is metallic or not</td>
</tr>
<tr>
<td>Roughness</td>
<td>How much light dispersal a surface provides</td>
</tr>
<tr>
<td>Ambient Occlusion</td>
<td>Self shadowing and enhancing surface details</td>
</tr>
<tr>
<td>Transparency</td>
<td>Limit use of transparency and utilize with separate material</td>
</tr>
</tbody>
</table>
More Information

https://developer.apple.com/wwdc18/805