



EXPLORATORY RESEARCH

PONDER

Emily Zacharias
Olivia Colburn
Gracie Banta
Esther Kim
Shilin Liu





APPLE VISION PRO

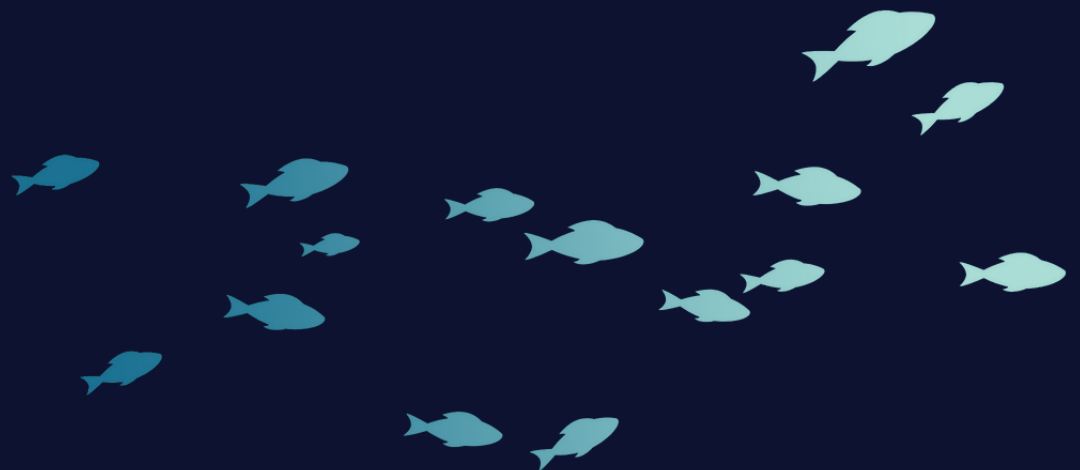




APPLE VISION PRO

Apple Vision Pro is a hybrid of both VR and AR. It seamlessly blends digital content with our physical space. The Vision Pro has both features of VR and AR. It allows apps to extend beyond the dimensions of our surroundings. What's unique about the Vision Pro is that it is Apple's first 3D camera. Photos and videos can be captured in 3D, and thus, re-lived with immersive spatial audio. It makes you feel like you're standing right where you took them.

Other brands like Oculus (acquired by Meta), HTC, and Sony have already developed VR products. Apple has taken a different approach to VR. The 'spatial' aspect of the Vision Pro will provide an experience that treads between augmented and virtual reality. It introduces a direction into a new technological paradigm.





VR/AR

Virtual Reality (VR) creates a simulated environment using computer technology. The computer generated environment creates scenes and objects that make people feel immersed in their surroundings. Essentially, VR builds a world. Whereas in Augmented Reality (AR), the real world we live in serves as the framework where computer-generated objects can be integrated.



HARDWARE AND DESIGN



The design of the Apple Vision Pro sports a futuristic, ski goggle-like design. The Vision Pro has more pixels, approximately 23 million across two displays, 2.5x more than a 4K TV. For each eye. The Vision Pro has a custom 3D lens to ensure that the UI stays within the person's view. It helps keep the visual consistent despite the person's movement. Other features include High Dynamic Range (HDR) and 'wide color' that delivers a superior image.

Not only does the Apple Vision Pro have next level graphics, there are also sensors to track the eyes, hands, and surrounding objects in real-time. It helps break the common conceptions of headset interfaces. The EyeSight feature specifically uses data from sensors to project a live feed of the eyes to an external display. Not only is the Vision Pro sensitive to eye and hand movements, it can predict intentions of those movements.





VISION PRO APPLICATIONS

Apple dedicated visionOS as the operating system, which is tailored for 'spatial computing.' visionOS will manage applications and VR landscapes to add to the experience. There are overlaps between visionOS, MacOS, and iOS. This expands the Apple interface and connections between all Apple products.

"VisionOS isn't just about driving the native features of the Vision Pro. The software is forward-looking, engineered to run a new generation of applications that maximize the device's 3D interface potential. It's a software platform that's ready to embrace existing iOS apps and optimally-crafted new ones."

There are different building blocks of spatial computing in visionOS:

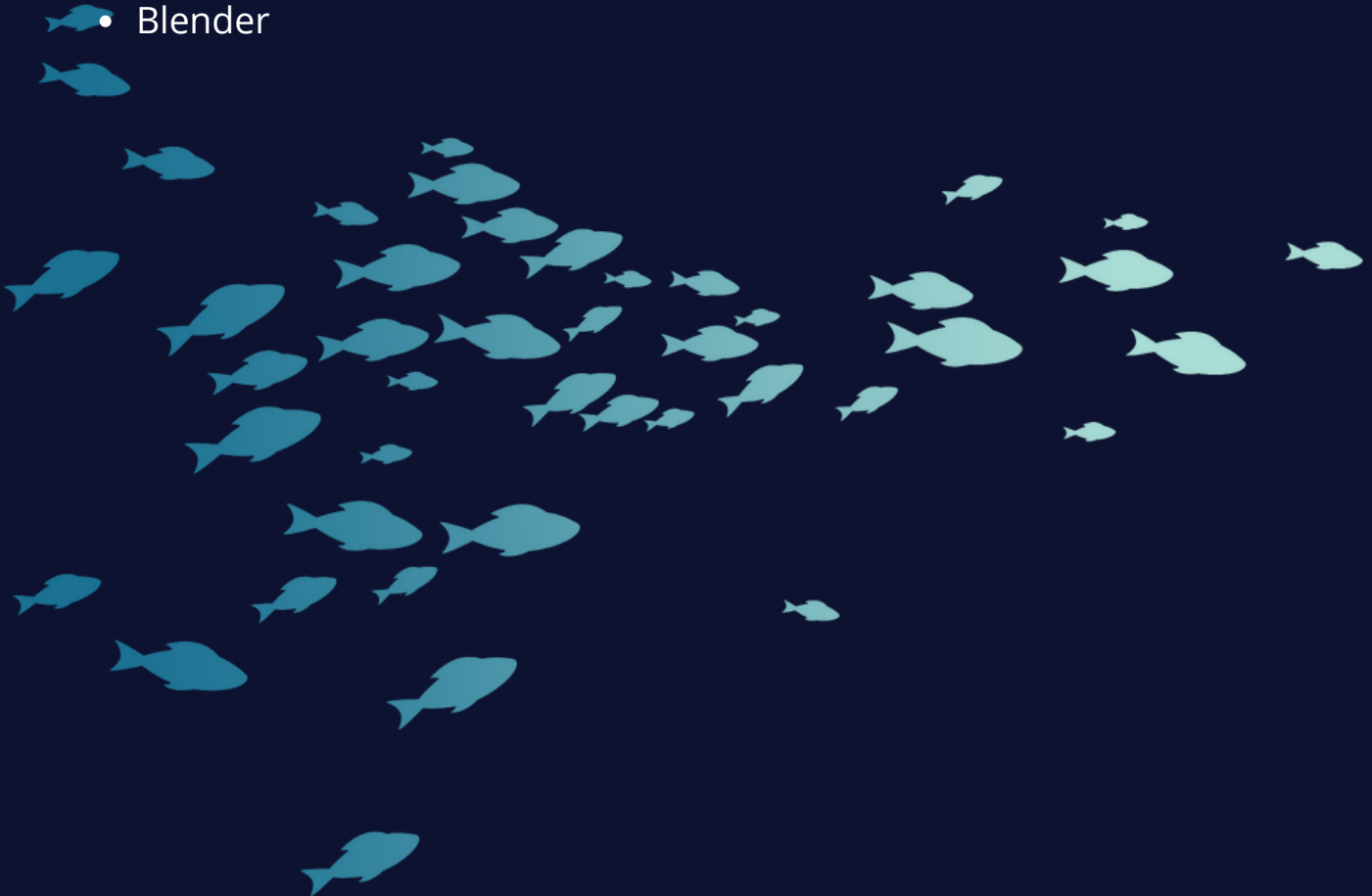
- Windows – 1 or more windows in app
 - Built with SwiftUI and traditional views
 - Similar to MacOS and iOS – new feature includes adding depth to experience through 3D content
- Volumes - depth to app made with SwiftUI scenes
 - 3D content can be created with RealityKit or Unity
 - Experience viewable from any angle in Shared Space of app's Full SSpace
- Space - Shared Space is where apps exist side by side, which is the default
 - Windows and volumes show content and can be repositioned

APPS USED

- SwiftUI
- RealityKit
- ARKit

Tools Needed

- Xcode – where development starts → supports visionOS SDK
 - Create tests and visualizations to explore collisions, occlusions, and scene understanding for your spatial content.
- Reality Composer Pro
- Unity
- Blender





CITATIONS

1. Citations

- a. <https://appleinsider.com/articles/23/08/18/hands-on-with-apple-vision-pro-in-the-wild>
- b. <https://www.theverge.com/2023/6/5/23738968/apple-vision-pro-ar-headset-features-specs-price-release-date-wwdc-2023>
- c. <https://www.iberdrola.com/innovation/virtual-reality>
- d. <https://www.encora.com/insights/apple-vision-pro-revolutionizing-the-virtual-reality-landscape>
- e. <https://www.forbes.com/sites/tiriasresearch/2023/07/05/apples-vision-pro-what-it-is-and-what-it-is-not/?sh=1bf594672f16>
- f. <https://developer.apple.com/videos/play/wwdc2023/10073>
- g. <https://developer.apple.com/visionos/>