EXPERIMENT NO. 2

Aim: Study of various VR headsets and controllers

Theory:

VR Headsets

1. Oculus Quest 2:
   - Type: Standalone VR headset.
   - Features: High-resolution display, wireless, hand tracking, large library of games and apps.
   - Platform: Oculus (Facebook/Meta).
2. Valve Index:
   - Type: PC VR headset.
   - Features: High refresh rate (up to 144Hz), wide field of view, finger tracking controllers.
   - Platform: SteamVR.
3. PlayStation VR (PSVR):
   - Type: Console VR headset.
   - Features: Designed for PlayStation 4 and 5, compatible with PS Move controllers.
   - Platform: PlayStation.
4. HTC Vive Pro 2:
   - Type: PC VR headset.
   - Features: High resolution, wide field of view, compatible with Vive and SteamVR accessories.
   - Platform: SteamVR and Viveport.
5. HP Reverb G2:
   - Type: PC VR headset.
   - Features: High resolution, Windows Mixed Reality platform, good comfort and audio quality.
   - Platform: Windows Mixed Reality and SteamVR.

VR Controllers

1. Oculus Touch Controllers:
   - Compatible with: Oculus Quest 2 and Rift S.
   - Features: Ergonomic design, precise tracking, intuitive buttons and thumbsticks.
2. Valve Index Controllers (Knuckles):
   - Compatible with: Valve Index, HTC Vive, and other SteamVR headsets.
   - Features: Finger tracking, adjustable strap for secure fit, pressure-sensitive sensors.
3. PlayStation Move Controllers:
   - Compatible with: PlayStation VR.

- ○ Features: Motion tracking, built-in buttons and triggers, haptic feedback.
4. HTC Vive Controllers:
   - ○ Compatible with: HTC Vive and Vive Pro.
   - ○ Features: Trackpad for navigation, grip buttons, precise tracking with base stations.
5. Windows Mixed Reality Controllers:
   - ○ Compatible with: Windows Mixed Reality headsets like HP Reverb G2.
   - ○ Features: Built-in motion tracking, touchpad and thumbstick, comfortable grip.

Demonstration of Oculus Quest 2

The Oculus Quest 2 is at the top of list for the best VR headsets for its great design, ease of use, and large library of games that you can get right on the headset itself.

Download the Oculus app to your PC by following this link.

To use Oculus Link, Meta recommends we have a PC with an Intel i5-4590 / AMD Ryzen 5 1500X or greater and at least 8GB of RAM. Most Nvidia GPUs from the 970-series and higher are compatible, as are AMD 400-series and higher GPUS.

Connecting Oculus Quest 2 to PC or Laptop

1. Make sure your Oculus Quest 2 is turned on. In the Oculus app, select Devices, and then Add Headset.

2. Select your device Quest 2

3. Select connection method. Two options are provided which are Link(cable) and Air Link (Wireless). Select Link(Cable) method.

4. Plug one end of the cable into your Oculus 2 headset, and the other end of the cable into your PC.

5. In the Oculus app, press Continue. On the screen that appears next, you can choose to test your cable connection, or press Continue. Your Oculus Quest 2 is now connected to your PC.

6. Put on your headset. A message displays in VR prompting you to **Allow access to data**. Select Deny. If you mistakenly 'Allow' the prompt, you must unplug your USB cable from the headset and plug it back in.

7. When prompted to **Enable Oculus Link**, select Enable to begin remote rendering using Oculus Link.

8. Setup the Guardian

9. Press Oculus Button

   A Toolbar will appear at the bottom like the picture below. The toolbar is also known as the "Universal Menu".

10. select the "**Quick Settings**" menu. It is located at the most left side of the Universal Menu. You can see the tooltip appears with its name.

11. The "Quick Settings" dashboard will appear. Now, you can see the "Guardian" menu in the right box.

12. Select "Guardian" in order to proceed with the process to reset it. A pop-up titled "Create Guardian Boundary" will appears. From there, you will be guided with the on-screen instructions to help you with the process.

Basic Oculus Quest 2 Controls

Left Hand	Right Hand
Left thumbstick - Move/Scroll	Right thumbstick - Turn/Scroll
X – Action	A – Action
Y – Teleport	B – Teleport
Menu - Open AltspaceVR menu	Oculus - Open OculusHome
Left grip - grab object with left hand	Right grip - grab object with right hand
Left trigger - Fire/Run	Right trigger – Fire
Click left thumbstick - Reset HMD and Altitude	

Hand Gestures

Gesture	Input
At rest	Default position
Point index finger	Grip button held
Thumbs up	Grip & trigger buttons held
Fist	Grip, trigger, and A/X buttons held

Conclusion:

Give features of Oculus Quest 2?

Answer->

The Oculus Quest 2 is a popular standalone VR headset with the following key features:

High-Resolution Display: It has a resolution of 1832x1920 per eye, providing clear and sharp visuals.

Standalone Operation: No need for a PC or external console; it works independently with a built-in processor (Qualcomm Snapdragon XR2).

6 Degrees of Freedom (6DoF): Tracks both head and hand movements for full immersion in VR environments.

Improved Controllers: Ergonomic touch controllers with improved haptic feedback and tracking for precise interactions.

Wireless PC VR