Quest 2

The Quest 2 is a virtual reality (VR) headset developed by Reality Labs, a division of Facebook, Inc. (now Meta Platforms). It was unveiled on September 16, 2020, and released on October 13 as the Oculus Quest 2. It was then rebranded as the Meta Quest 2 in 2022, as part of a company-wide phase-out of the Oculus brand after the rebranding of Facebook, Inc. as Meta.

It is a refresh of the original Oculus Quest with a similar design, but with a lighter weight, updated internal specifications, a display with a higher refresh rate and per-eye resolution, and updated Oculus Touch controllers with improved battery life. As with its predecessor, the Quest 2 can run as either a standalone headset with an internal, Android-based operating system, or with Oculus Rift-compatible VR software running on a desktop computer.

The Quest 2 received mostly positive reviews as an incremental update to the Quest, but some of its changes faced criticism, including its stock head strap, reduced interpupillary distance (IPD) options, and a new requirement for users to log in with a Facebook account to use the headset and Oculus services.

Optical markerless hand-tracking systems incorporated into virtual reality (VR) headsets are transforming the ability to assess fine motor skills in VR. This promises to have far-reaching implications for the increased applicability of VR across scientific, industrial, and clinical settings. However, so far, there are little data regarding the accuracy, delay, and overall performance of these types of hand-tracking systems. Here we present a novel methodological framework based on a fixed grid of targets, which can be easily applied to measure these systems' absolute positional error and delay. We also demonstrate a method to assess finger joint-angle accuracy. We used this framework to evaluate the Meta Quest 2 hand-tracking system. Our results showed an average fingertip positional error of 1.1cm, an average finger joint angle error of 9.6∘ , and an average temporal delay of 45.0 ms. This methodological framework provides a powerful tool to ensure the reliability and validity of data originating from VR-based, markerless hand-tracking systems [1)]

Three types of bacteria were inoculated onto porous and nonporous surfaces of 2 VR devices: the Meta Oculus Quest and Meta Oculus Quest 2. Disinfection was performed using either isopropyl alcohol or alcohol-free quaternary ammonium wipes. A quantitative culture was used to assess the adequacy of disinfection. A survey was separately sent out to VR device technicians at other pediatric healthcare institutes to compare the methods of disinfection and how they were established.

Results: Both products achieved adequate disinfection of the treated surfaces; however, a greater log-kill was achieved on nonporous surfaces than on porous surfaces. Alcohol performed better than quaternary ammonium on porous surfaces. The survey respondents reported a wide variability in disinfection processes with only 1 person reporting an established standard operating procedure.

Conclusions: Disinfection can be achieved through the use of either isopropyl alcohol or quaternary ammonium products. Porous surfaces showed lesser log-kill rates than nonporous surfaces, indicating that the use of an added barrier may be of benefit and should be a point of future research. Given the variability in the disinfection process across healthcare systems, a standard operating procedure is proposed [2)]

World events have caused a dramatic rise in the use of video conferencing solutions such as Zoom and FaceTime. Although 3D capture and display technologies are becoming common in consumer products (e.g., Apple iPhone TrueDepth sensors, Microsoft Kinect devices, and Meta Quest VR headsets), 3D telecommunication has not yet seen any appreciable adoption. Researchers have made great progress in developing advanced 3D telepresence systems, but often with burdensome hardware and network requirements.

Siemonsma presents HoloKinect, an open-source, user-friendly, and GPU-accelerated platform for enabling live, two-way 3D video conferencing on commodity hardware and a standard broadband internet connection. A Microsoft Azure Kinect serves as the capture device and a Looking Glass Portrait multiscopically displays the final reconstructed 3D mesh for a hologram-like effect. HoloKinect packs color and depth information into a single video stream, leveraging multiwavelength depth (MWD) encoding to store depth maps in standard RGB video frames. The video stream is compressed with highly optimized and hardware-accelerated video codecs such as H.264. A search of the depth and video encoding parameter space was performed to analyze the quantitative and qualitative losses resulting from HoloKinect's lossy compression scheme. Visual results were acceptable at all tested bitrates (3-30 Mbps), while the best results were achieved with higher video bitrates and full 4:4:4 chroma sampling. RMSE values of the recovered depth measurements were low across all settings permutations [3]

[1]
Abdlkarim D, Di Luca M, Aves P, Maaroufi M, Yeo SH, Miall RC, Holland P, Galea JM. A methodological framework to assess the accuracy of virtual reality hand-tracking systems: A case study with the Meta Quest 2. Behav Res Methods. 2023 Feb 13. doi: 10.3758/s13428-022-02051-8. Epub ahead of print. PMID: 36781700.
[2]
Roberts SC, Havill NL, Flores RM, Hendrix Ii CA, Williams MJ, Feinn RS, Choi SJ, Martinello RA, Marks AM, Murray TS. Disinfection of Virtual Reality Devices in Health Care Settings: In Vitro Assessment and Survey Study. J Med Internet Res. 2022 Dec 1;24(12):e42332. doi: 10.2196/42332. PMID: 36269222; PMCID: PMC9756115.
[3]
Siemonsma S, Bell T. HoloKinect: Holographic 3D Video Conferencing. Sensors (Basel). 2022 Oct 23;22(21):8118. doi: 10.3390/s22218118. PMID: 36365816; PMCID: PMC9659293.