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ultraleap 

Product Catalogue
Virtual, Augmented
& Mixed Reality

The potential of XR is limitless

In XR you can be anyone or anything, anywhere, at any time. New possibilities open for consumers and businesses alike: from immersive gaming to better employee training.

XR technology has improved dramatically in recent years. Better displays, spatialized audio, and now optimized for mobile chipsets – no need for cables, massive computers, and graphics cards.

But to fully realize its potential, XR needs to remove the last barrier to entry: the user interface. Today, gaming controllers dominate XR interaction. But controllers aren't for everyone.

Hand tracking removes barriers to entry

Using hand tracking to supplement or replace controllers expands the XR market. Natural, intuitive interaction brings in new users of all ages and levels of technical competency.

Gemini is the ultimate hand tracking solution from the world's leaders. Its robust, reliable hand tracking will bring XR, and your product, to the masses.

Benefits of Ultraleap Gemini hand tracking



Fast initialization: See your hands and start interacting immediately

Robust for different hand anatomy: Works for everyone

Interact naturally with two hands, even if one is partly obscured

Works in a variety of different lighting conditions

Picks out hands even against cluttered backgrounds

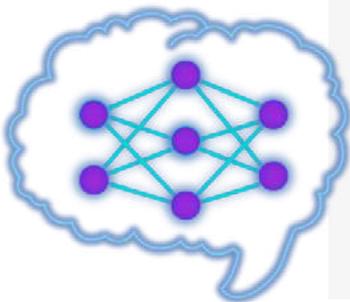
Flexible for different platforms and camera hardware

Hand Tracking Technology Stack



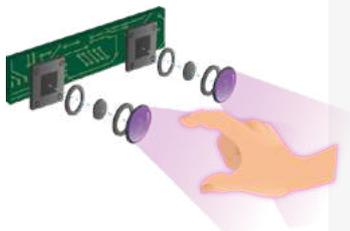
Developer Tooling

We have the most widely deployed and advanced hand tracking tooling. There are over 350k developers in the Ultraleap community and we have a decade of feedback to draw on.



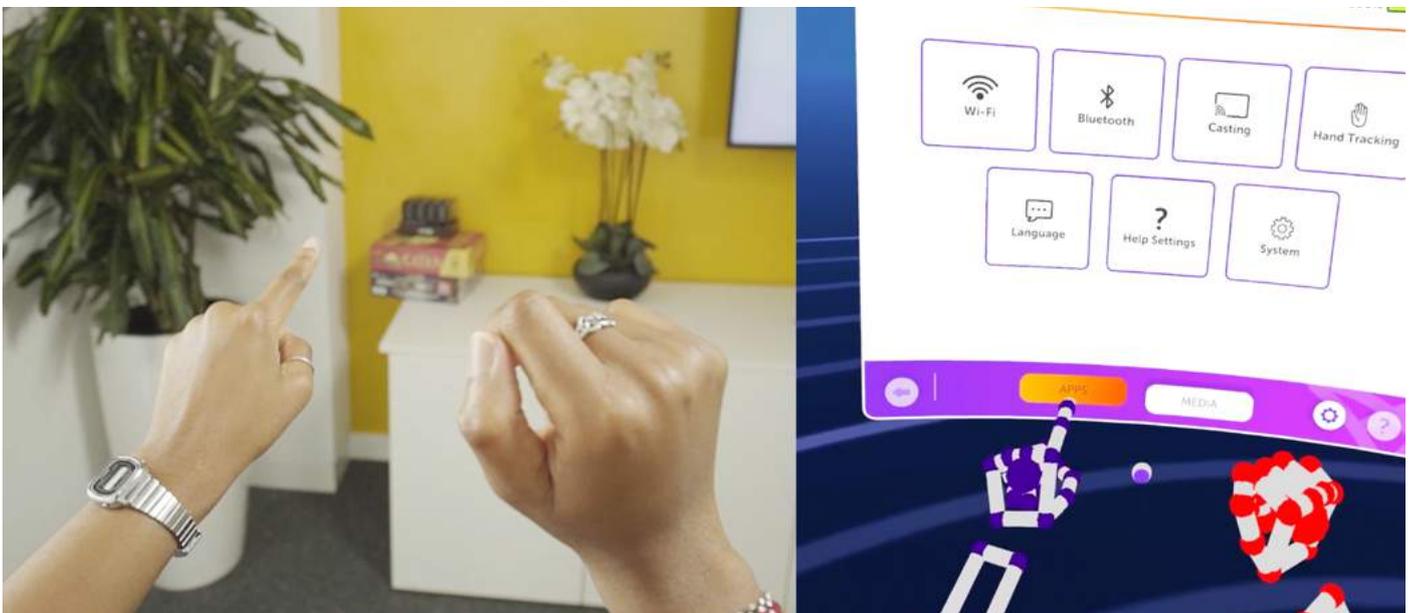
Tracking Software

Gemini is the fifth generation of our computer vision model. We invented this technology and Gemini's unified neural network is several generations ahead of other solutions. PC VR and mobile HMDs are both supported.



Tracking Cameras

Purpose-built camera modules that push the limits of field of view. Architecture based on infrared illumination provides consistent and reliable data even in challenging environments.



Working with Ultraleap



Evaluate



Integrate



Deploy



Evaluate

Plug-and-play hardware and tools for rapid prototyping.

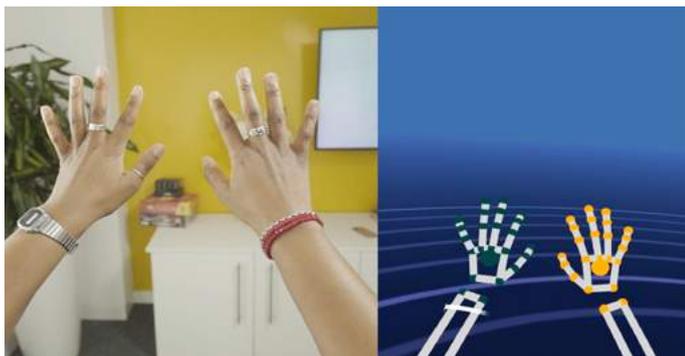
- Stereo IR 170 Evaluation Kit
- Leap Motion Controller
- Hand tracking demos
- Unity/Unreal tooling and easy-to-use XR design guidelines



Integrate

Reference designs and integration support from our engineering team.

- Stereo IR 170 camera module
- Qualcomm® Snapdragon™ XR2 5G chipset and reference design



Deploy

Develop on the platform of your choice and draw on our years of design experience.

- Unity, Unreal, OpenXR and MRTK-Unity developer tooling plus LeapC SDK
- XR design guidelines – detailed guidance for developing with hand tracking
- Worldwide community of over 350,000 hand tracking developers

Stereo IR 170

Hand tracking camera module

Purpose-built camera module suitable for integration into VR/AR/MR headsets. Pushes the limits of field of view and with architecture based on infrared illumination to provide reliable hand tracking data even in challenging environments.

Ultraleap Stereo IR 170 features a wider field of view, longer tracking range, lower power consumption, and slimmer form factor than the Leap Motion Controller. It's capable of tracking hands within a 3D interactive zone that extends from 10cm (4") to 75cm (29.5") or more, extending from the device in a 170x170° typical field of view (160x160° minimum).

Stereo IR 170 Evaluation Kit

The Stereo IR 170 Evaluation Kit consists of the Ultraleap Stereo IR 170 in a plastic housing with USB header, allowing for easy plug-and-play evaluation. CAD files for an Evaluation Kit mount are also available from www.developer.ultraleap.com.

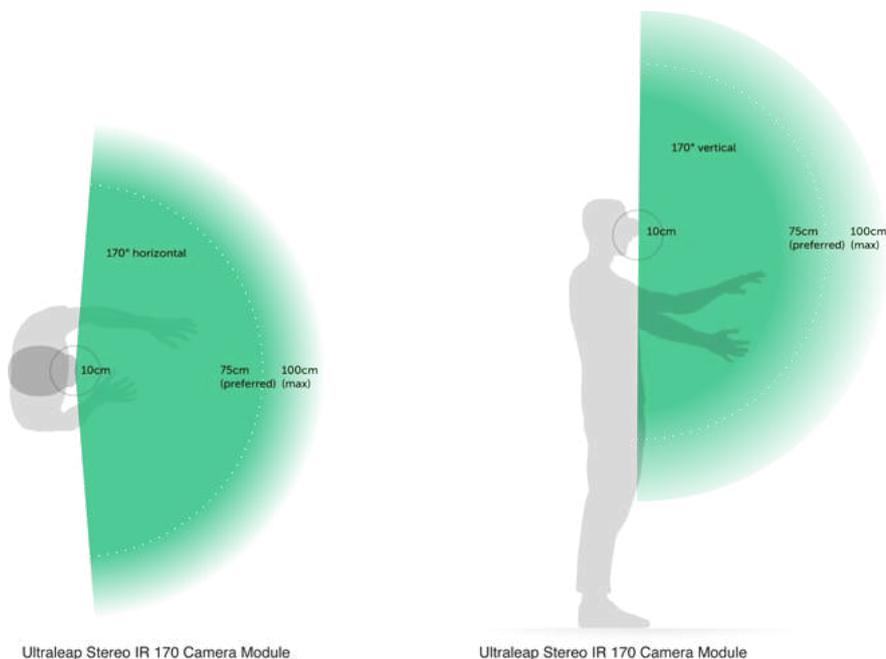


Stereo IR 170



Stereo IR 170 Evaluation Kit

Simulation of Stereo IR 170 tracking range



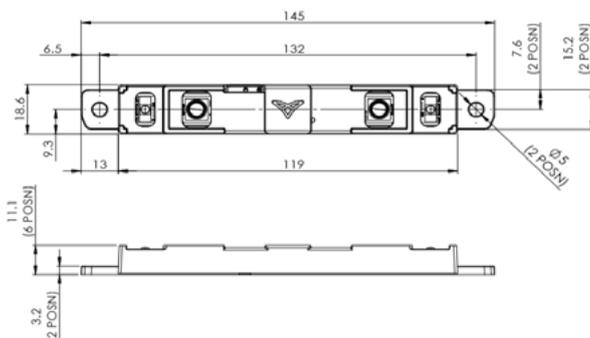
Stereo IR 170 specifications

Power supply:	5V DC via USB connector (minimum 0.5A).
Data connection:	Micro USB Type-B (2.0 or 3.0) when in plastic housing. When integrated, PCB module can be wired directly.
Mounting:	CAD files for Evaluation Kit mount available from www.developer.ultraleap.com . See next section for example VR headset integration.
Interaction zone:	Depth of between 10cm (4") to 75cm (29.5") preferred, up to 1m (39") maximum; 170x170° typical field of view (160x160° minimum). Tracking works in a range of environmental conditions.
Cameras:	Stereo IR operating at 90fps
Operating wavelength:	850nm. Stereo IR 170 provides its own illumination via two IR LEDs spaced on either side of the cameras.
Ambient operating temperature:	0° to 40°C (32° to 104°F) <i>N.B. Out of case operating temperature range is slightly wider, 0° to 50°C (32° to 122°F).</i>
Minimum system requirements:	Windows® 7+; AMD Phenom™ II or Intel® Core™ i3/i5/i7 processor; 2GB RAM; USB 2.0 port. Snapdragon™ XR2 (as per Qualcomm® reference design details)
Software:	Downloadable from https://www.developer.ultraleap.com

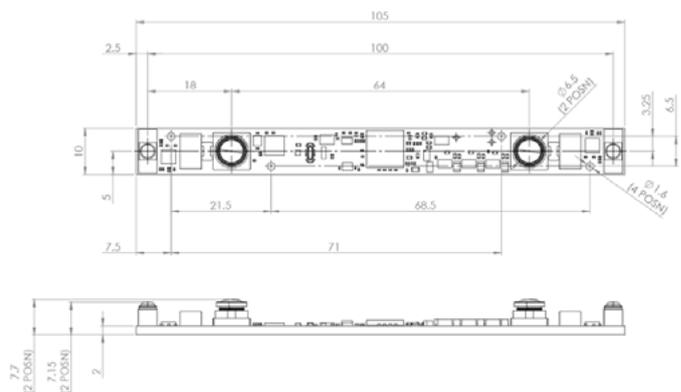
Intended use (Stereo IR 170 Evaluation Kit)

The Stereo IR 170 Evaluation Kit is intended for exploration and development purposes only. This version of hardware is not tested or certified compliant to CE requirements or equivalent international standards. Additional integration and certification will be required for use in commercial and other deployments. [Contact Ultraleap](#) for advice and support.

All dimensions are in mm.



Stereo IR 170 Evaluation Kit
Weight: 22g



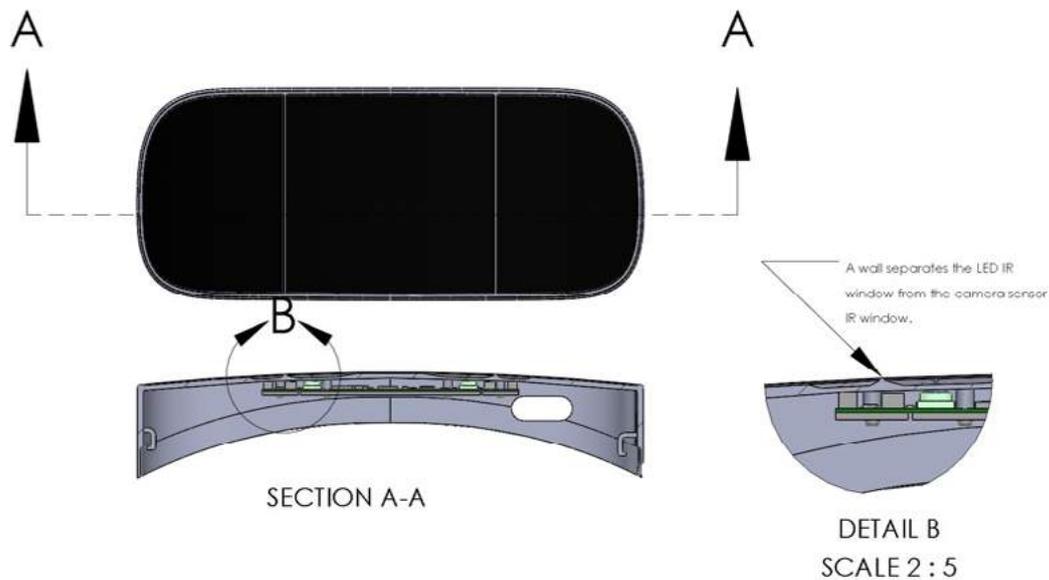
Stereo IR 170
Weight: 10g

Stereo IR 170 Example Integration: VR headset

Front Cover Design

The design uses a window of thickness 0.5mm constructed from Clarex material MHA0130 MC-160603 NIR-70N. It is curved for style. However, the radius of curvature is very large to prevent image distortion.

The LEDs are positioned less than 0.5mm away from the infrared (IR) window. The IR window is separated into 3 separate pieces with an opaque gap separating the sections. The LEDs are covered by a different section to the camera lenses. This prevents light leaking through the window and causing glare on the cameras.

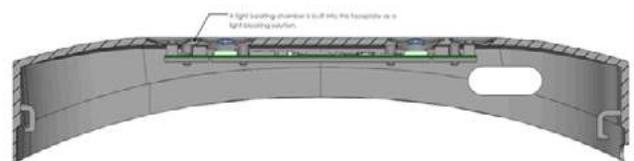
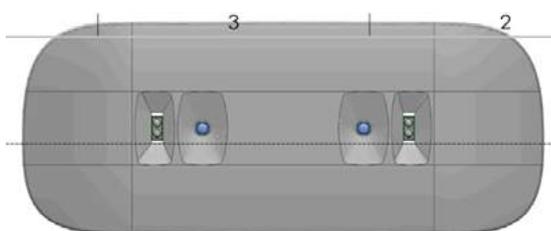


Example of infrared window design for Stereo IR 170.

Infrared Glare Prevention

A black silicone membrane is positioned underneath the front cover. Chamfered holes surround the LEDs and camera lenses. The chamfer has a shallow angle, giving the lenses a 170° horizontal and vertical clearance, and the LEDs 150° of clearance.

When the IR window is fitted, the rubber blockers' walls compress against it. The height of the blocker allows for this and is oversized by 0.3mm when uncompressed. This prevents the LEDs' IR light from causing glare.



Front view of the blocker positioned over Stereo IR 170

Side view of the blocker positioned over Stereo IR 170

Leap Motion Controller™

Hand tracking camera module

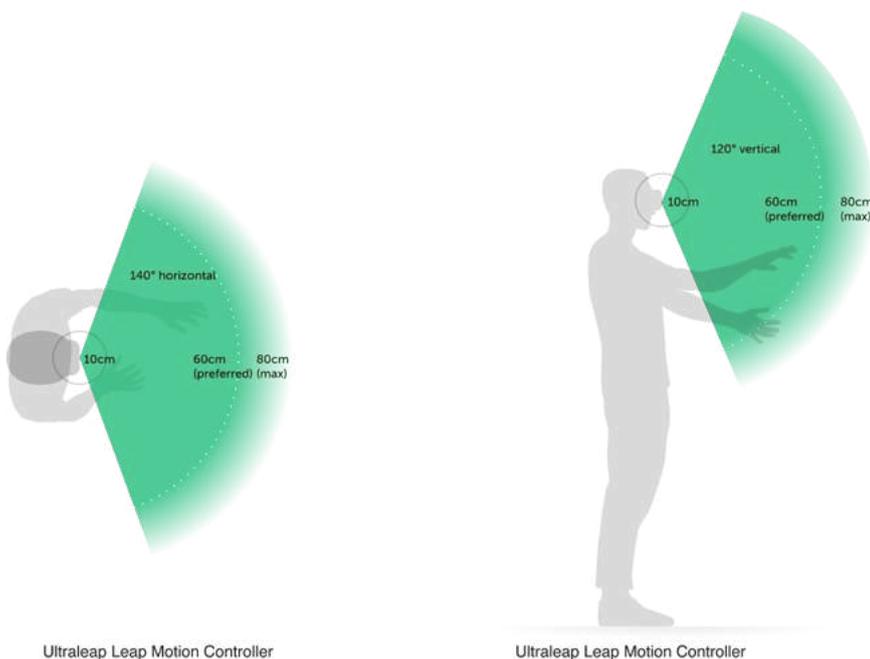
Purpose-built camera module with architecture based on infrared illumination to provide reliable hand tracking data even in challenging environments.

Small, fast, and accurate, the Leap Motion Controller is capable of tracking hands within a 3D interactive zone that extends up to 60cm (24") or more, extending from the device in a 140x120° typical field of view.

The Leap Motion Controller can be mounted as a peripheral to existing VR headsets using our VR Developer Mount. The mount allows for a consistent and reliable placement and angle across different headsets.



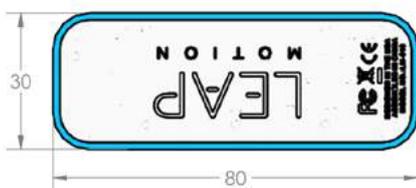
Simulation of Leap Motion Controller tracking range



Leap Motion Controller specifications

Power supply:	5V DC via USB connector (minimum 0.5A)
Data connection:	USB 2.0 (packaged with USB 2/3 hybrid cable, but can be used with any certified USB standard cables with the Hi-Speed USB 2.0 logo featured on the packaging).
Mounting:	Using a custom-cut 3M™ adhesive, the VR Developer Mount (available separately) enables stable adhesion to both curved and flat surfaces. Also packaged with an additional 4.5m-long (15') USB extender cable.
Interaction zone:	Depth of up to 60cm (24") preferred, up to 80cm (31") maximum; 140x120° typical field of view. Tracking works in a range of environmental conditions.
Cameras:	Two 640x240-pixel near-infrared cameras; spaced 40mm apart; with infrared-transparent window, operate in the 850nm +/-25 spectral range; typically operates at 120Hz; capable of image capture within 1/2000th of a second.
LEDs:	Three, spaced on either side and between the cameras, baffled to prevent overlaps
Construction:	Aluminium and scratch-resistant glass
Ambient operating temperature:	0° to 45°C (32° to 113°F)
Storage temperature:	-10° to 50°C (14° to 122°F)
Relative Humidity:	5% to 85% (non-condensing)
Operating Altitude:	0 to 3048 meters (0 to 10,000 feet)
Compliance:	CE, FCC, CAN ICES-3, REACH, RoHS
Minimum system requirements (desktop):	Windows® 7+ or Mac® OS X 10.7 (note that OSX is no longer formally supported); AMD Phenom™ II or Intel® Core™ i3/i5/i7 processor; 2 GB RAM; USB 2.0 port.
Software:	Downloadable from https://www.developer.ultraleap.com

All dimensions are in mm



Weight: 32g



The VR Developer Mount is designed in two pieces that clip together: one that encases the Leap Motion Controller, and one that attaches directly to the headset.

Qualcomm® Snapdragon™ XR2 5G

Chipset and reference design with integrated hand tracking

Ultraleap hand tracking is pre-integrated and optimized on the standalone, untethered Qualcomm Snapdragon XR2 5G reference design.

The Snapdragon XR2 5G Platform is the world’s first 5G-supported platform designed specifically for untethered XR. Powered by the Snapdragon XR2 Platform, the reference design has 2x the CPU and GPU performance, 4x more video bandwidth, 6x higher resolution and 11x AI improvement compared to Qualcomm’s current widely adopted XR platform.

Running alongside other features, headsets built using the XR2 reference design can take advantage of integrated Ultraleap hand tracking. This includes infrared emitters, a wide field of view, and long tracking range similar to that of the Stereo IR 170 camera module.



Qualcomm Snapdragon XR2 hand tracking specifications

These specifications refer to the dedicated camera reference design.

Interaction zone:	Depth of between 10cm (4") to 75cm (29.5") preferred, up to 1m (39") maximum; 170x170° typical field of view (160x160° minimum). Tracking works in a range of environmental conditions.
Cameras:	Stereo IR operating at 60fps
Operating wavelength:	850nm. Provides its own illumination via two IR LEDs spaced on either side of the cameras.

Developer Tooling

Develop on the platform of your choice



UNREAL
ENGINE



Ultraleap Plugin for Unity

Connects your Unity project to hand tracking data and provides tools and examples for easy development of intuitive hand interaction in VR/AR/MR.

- **Hands Module:** Bind Ultraleap data to your own hand assets or use our optimized and pre-rigged hand models
- **Interaction Engine:** Layer that exists between game engine and real-world physics, making interaction with virtual objects feel natural, satisfying, and easy to use

Ultraleap Plugin for Unreal

Connects your Unreal project to hand tracking data and provides tools and examples for easy development of intuitive hand interaction in VR/AR/MR.

- Enable interaction with virtual objects
- User interface examples
- Use convenient blueprints to select and play
- Use a custom approach via blueprints or C++

Ultraleap OpenXR API Layer

OpenXR is an open, royalty-free standard from the Khronos Group that enables the development of cross-platform XR experiences. Our OpenXR API layer adds seamless hand tracking support.

MRTK for Unity

MRTK-Unity supports Ultraleap hand tracking, leveraging our Tracking Software 4.0+ and Ultraleap Plugin for Unity. This means cross-platform applications developed with MRTK can work not only on HoloLens 2 but on other head-mounted devices with Ultraleap hand tracking.

Ultraleap SDK (for LeapC API)

LeapC is a C-style API for accessing tracking data from the Ultraleap tracking platform. Our standard hand tracking download includes an SDK for developing applications with native code.

Ultraleap's industry-leading partners include:



Integration and implementation examples



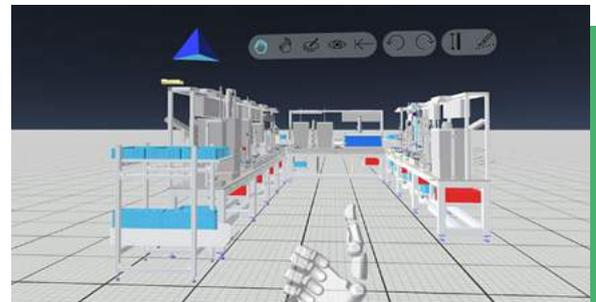
ENTERPRISE VR HEADSETS: **Varjo** integrated Ultraleap hand tracking into their VR-3 and XR-3 headsets: the industry's highest resolution devices.



CONSUMER VR HEADSETS: **Lynx** integrated Ultraleap hand tracking into their Lynx R-1 MR headset using the **Qualcomm** Snapdragon XR2 5G reference design.



VR TRAINING SOFTWARE: **Lufthansa Aviation Training/NMY** use Ultraleap hand tracking to enable trainee flight attendants to act intuitively through natural hand gestures.



VR INDUSTRIAL DESIGN SOFTWARE: **R3DT** has accelerated the process of designing new production lines with an easy-to-use VR tool powered by Ultraleap hand tracking.



VR PRODUCT DESIGN SOFTWARE: **Autodesk VRED** reduced friction in virtual product design for automotive by adding the option of interacting with hand tracking.



LOCATION-BASED VR: **Dreamcraft Attractions** embedded the Ultraleap Stereo IR 170 into custom VR headsets for their *Twilight Saga: Midnight Ride* attraction.

Hand tracking design guidelines

Prototype and build transformational user experiences

XR interfaces optimized for hand tracking feature a few key differences to those designed solely for controllers. Our detailed hand tracking design guidelines distill years of experience designing hand tracking for XR into easy-to-implement recommendations.

Building with virtual objects

- When to build for direct physical manipulation of virtual objects
- How to build virtual objects with clear affordances
- How to build in effective feedback
- Design guidance for object behaviour
- Designing virtual objects that go beyond what's possible in the physical world



Building with gestures and poses

- When to use abstract gestures and poses
- Best practice for educating users on gestures and poses



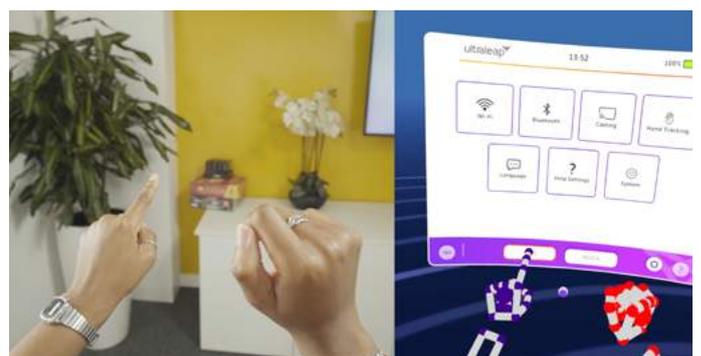
Designing instructional information

- How to introduce gestures and interactions
- Designing positioning tutorials
- Designing interaction tutorials
- Using character mimicking



Designing menus and UI panels

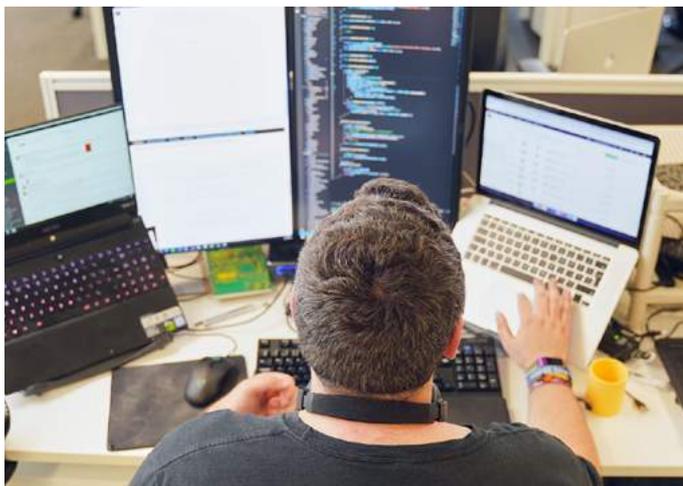
- Designing virtually wearable menus
- Designing world-anchored menus
- Designing UI panels



Ready to get started?

We have a team of more than 150 spread across the world, with locations in Silicon Valley, US and Bristol, UK.

It includes world-leading experts in interface design, acoustics, machine learning, and computer vision. Ultraleap is ISO 9001 accredited and our technology is widely used in VR/AR, automotive, digital out-of-home marketing, and self-serve kiosks.



TALK TO OUR TEAM

<https://www.ultraleap.com/business-contact/>

BUY TRACKING PRODUCTS ONLINE

<https://www.ultraleap.com/tracking/>

DOWNLOAD SOFTWARE

<https://www.developer.ultraleap.com>

DEVELOPER DOCUMENTATION

<https://docs.ultraleap.com/>

"[Ultraleap] focused on something with a tight unwavering gaze and they are clearly far-and-away the best at what they do as a result."

TechCrunch



UK: The West Wing, Glass Wharf, Bristol
England | BS2 0EL | +44 117 325 9002

US: 2522 Leghorn Street, Mountain View
California, 94043 | USA | +1 650 600 9916

enterprise@ultraleap.com
www.ultraleap.com/

