

LPVR-CAD

IMU / Optical Fusion-based Large Room-scale Tracking Solution for Immersive 3D Visualization



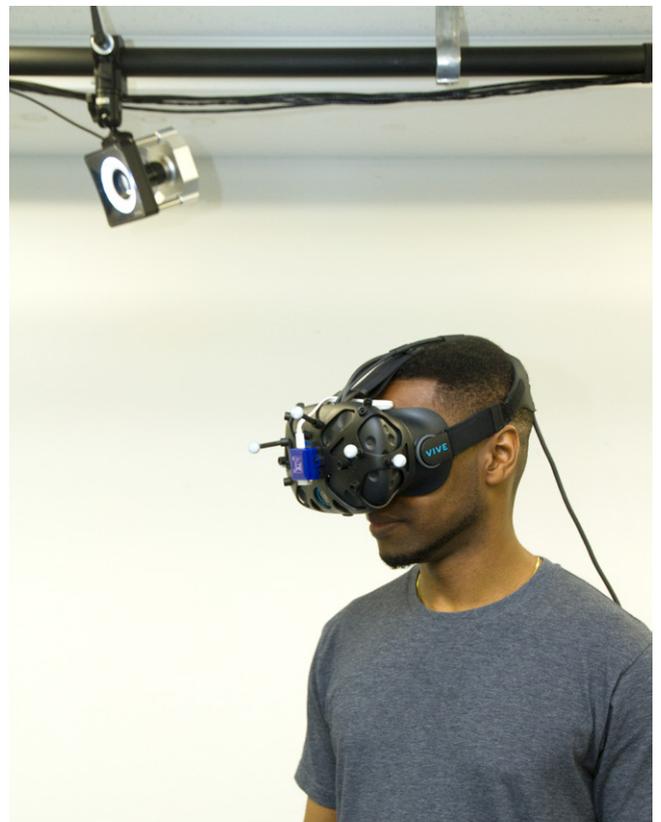
Consumer virtual reality head mounted display (HMD) systems such as the HTC VIVE support so-called room scale tracking. These systems are able to track head and controller motion of a user not only in a sitting or other stationary position, but support free, room-wide motions. The volume of this room scale tracking is limited to the capabilities of the specific system, usually covering around 5m x 5m x 3m. Whereas for single user games or applications this space may be sufficient, especially multi-user, location-based VR applications such as arcade-style game setups or enterprise applications require larger tracking volumes.

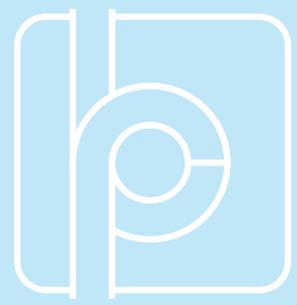
Optical tracking systems such as ART offer tracking volumes of more than 15m x 15m x 3m. Although the positioning accuracy of optical tracking systems are in the sub-millimeter range, especially orientation measurement is often not sufficient to provide an immersive experience to the user. Image processing and and signal routing may introduce further latencies.

Our location-based VR / large room-scale tracking solution solves this problem by combining optical tracking information with inertial measurement data using a special predictive algorithm based on a head motion model.

Key Features

- VR / AR HMD low-latency tracking in large spaces
- Sensor fusion of optical tracking information and low-latency IMU data for positional and rotational tracking
- Compatible with VIVE, VIVE Pro and Varjo headsets
- Compatible with ART-tracking, Optitrack and VICON optical tracking systems
- SteamVR driver supports VRED, Unity and Unreal-based 3D engines
- Full update support for the latest SteamVR versions





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System Specifications

Product name	LPVR-CAD
Compatible HMDs	HTC VIVE (Pro), Varjo VR-1/2, XR-1
Compatible tracking systems	ART, Optitrack, VICON, VRPN-based tracking solutions
Compatible software	Unity, Unreal, Autodesk VRED, all SteamVR-compatible applications
Controller support	VIVE controller
Inertial measurement unit	LPMS-CU2 with VR firmware
Positioning accuracy	1-10 mm (depending on optical tracking setup)
Rotation accuracy	0.2°
Tracking latency	Zero-latency (using head motion prediction)
Tracking space	Unlimited (depending on optical tracking setup)
Driver software	OpenVR driver
Update rate	800Hz
Operating system	Windows 10 with latest SteamVR environment
System components	IMU sensor, HMD marker holder, hand controller marker holder, accessory cable and screws
Licensing	License tied to LP-Research IMU. Multiple IMUs can be used with same license.

NOTE: For detailed specifications, please refer to our product manuals.

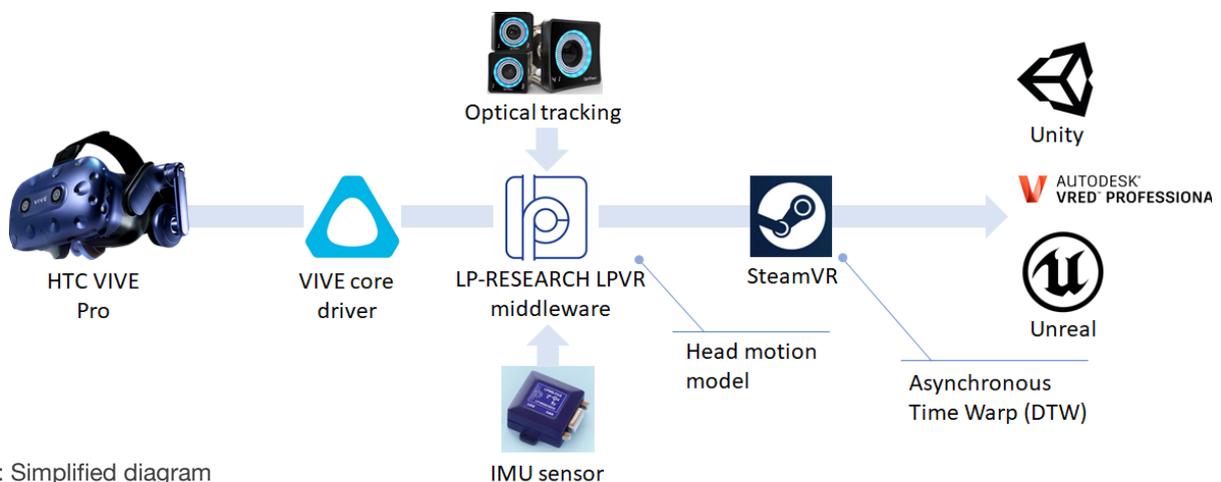
Set Contents



Applications

- Automotive CAD and pre-production design inspection
- Location-based virtual reality entertainment
- Immersive police and firefighter mission training
- Interactive theater and art installations

Functional Overview



NOTE: Simplified diagram