M2S Laboratory

Immermove

Immersive and motion capture gymnasium for motion analysis.

Immersive and motion analysis experiments

The **Immermove experimental platform** features a large-scale, high-resolution immersive VR display (a four-sided CAVE, 12×4×4 m12×4×4m) housed within a fully equipped sports gymnasium (30×20 m30×20m). It integrates advanced motion capture systems and is designed for interdisciplinary applications, supporting research in fields such as **biomechanics**, **robotics**, **cognitive sciences**, and **ergonomics**.

The platform is used to investigate how individuals **move**, **perceive**, and **interact** within virtual environments, with applications ranging from **rehabilitation** and **sports** training to vehicle simulation and human-robot interaction. By bridging motion technology with immersive environments, Immermove contributes to both **fundamental research** and applied innovations across multiple domains.

Immermove is coupled with Immersia, the VR platform at Irisa-Inria, forming a unique collaborative immersive infrastructure known as ***ImmerSTAR***. You can dowload the flyer here.

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Immersive VR technical specifications

SCREENS (4 sides)

- Face retro-projected main screen: 12 x 4 m²

- Ground direct-projected screen: 12 x 4 m²
- Lateral retro-projected side screens : 4 x 4 m²

PROJECTORS

- 6x Stereo Projectors (120 Hz) : Barco Tri-DLP UDM 4K30
- Active stereoscopy with RF Volfoni ActiveEyes

RENDERING

- Hardware : 7 PC (1 master + 6 slaves) with RTX 6000 ADA
- Software: MiddleVR 3.2

TRACKING + Inputs

- 12x Vicon Bonita cameras
- 1 Vicon Apex controller

AUDIO

- Surround sound 5.1

Head mounted display (HMD):

- Vive Focus Vision (x3) + Ultimate Trackers
- Meta Quest 3 (x3)

- HTC Vive Eye Pro

  (x8)

Motion capture facilities

Motion capture opto-electronic systems

- Qualisys system with 27 cameras (Oqus 7+)
- Vicon system (Oxford Metrics) with 24 camera (MX and Vantage)
- Optitrack (Natural Point) with 20 cameras

Motion capture video-based :

- Qualisys system with 10 miqus video plus cameras
- Theia Markerless software
- Kinect Azure 2 (Microsoft)

Dynamics

- Ground forces measurement: 2 force plates 120x60cm (AMTI)

Electromyographic systems

- 16 wireless Trigno Advanti (Delsys)
- 16 waterproof wireless mini wave infinity with a Wave Plus EMG system (Cometa)

Ergometers

- Cycle Ergometer: SRM indoortrainer science version with 7 powercontrol and a crank torque analysis system