

XR-CAVE - Immersive XR Spaces - Digital Twins - LED Volumes



project: syntropy (Germany / KSA / Sweden / Singapore) creates audiovisual technologies and solutions for professional simulation and training environments, immersive XR environments, XR-CAVEs, media based attractions such as flying theaters, dark rides, and much more.

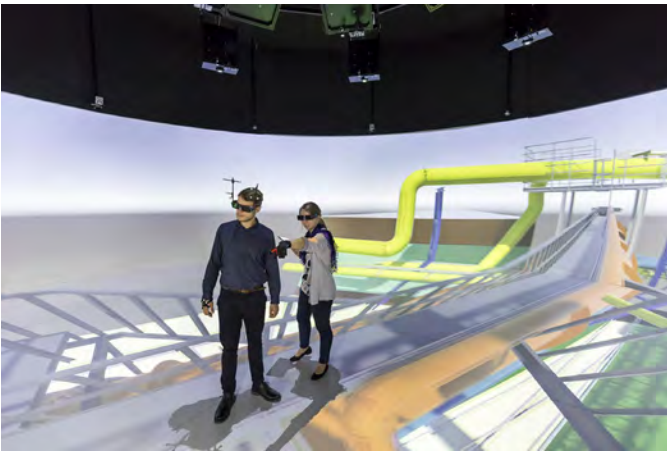
Immersive XR (Extended Reality) spaces are environments that blur the boundary between the physical and virtual worlds and are designed to fully engage users through multisensory experiences, often utilising technologies such as Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), projection mapping, 3D audio and interactive technologies (sensors, tracking systems of all kinds).

Immersive XR spaces can be next-generation **XR CAVE (Cave Automatic Virtual Environment)** environments used for research, product and process development, education and training.

They may also take the form of so-called **LED Volumes** (dv-LED-based virtual film production studios), which replace green screens with LED walls and utilise real-time VR technology, virtual lighting and camera movement tracking, combining these with physical objects and real actors.

Immersion is achieved not only through the technologies mentioned above, but also through the sheer size of the space, which allows users to move freely, interact in groups, cover the entire human field of perception, and much more.

Immersive XR spaces go far beyond applications in culture, entertainment and gaming, and are making inroads into professional sectors: professional training and simulation applications (civil and military), AI-powered digital twins and collaborative working environments.



project:syntropy

Try another World



Digital Twins

Digital twins are virtual, real-time representations of physical objects or processes. They are frequently used to monitor, analyse, simulate, maintain and optimise products, processes and systems throughout their entire lifecycle. Real-time data is continuously collected from them, providing insights into their condition and behaviour. Product and machine twins contain data covering their entire lifecycle and offer insights into product behaviour and potential for optimisation, e.g. for predictive maintenance, energy efficiency and much more.

Digital process twins link technical factory processes with company-wide business processes, e.g. to plan, design, test, operate and optimise entire production and factory facilities and complex production processes before and after their construction. Integrating a digital twin into an immersive XR space makes it possible to do more than just view data on a screen; instead, using all available VR/AR/MR technologies and the growing influence of AI in the visualisation and synchronisation of vast amounts of real-time data, users can 'immerse' themselves in the data and 'navigate' through it. A frequently used scenario is urban planning with **UDTs (Urban Digital Twins)**, which are used, for example, in Singapore, Shanghai (**SUPEC**) and Zurich for a wide range of modelling, simulation and analysis applications: economic crises, energy security, land-use planning, military conflicts, mobility, natural disasters (floods, earthquakes), pandemics, transport...

project: syntropy has been involved in many flagship projects (e.g. SUPEC Shanghai, Fraunhofer Society Elbe Dome 2.0) creating large immersive XR spaces: we realized XR-environments for UDTs and factory planning as well as XR-CAVEs.



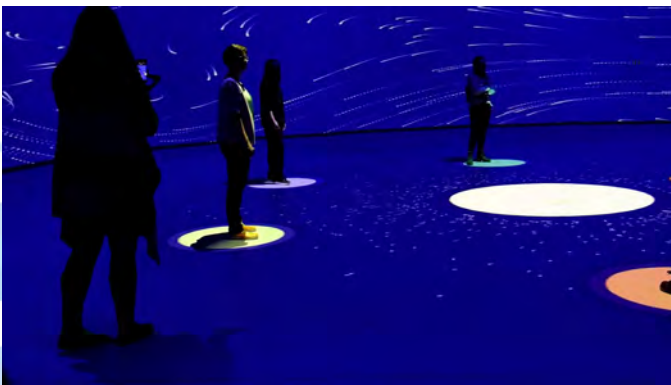
Immersive XR-Spaces can furthermore be used for a variety of purposes across different fields:

1. Entertainment and Computer Games

- Virtual Reality Gaming: Immersive spaces create lifelike gaming environments where players can interact with the virtual world.
- Theme Parks and Attractions: Immersive dark rides, interactive environments, and storytelling environments.
- Cinema and Theater: 360-degree films and immersive theater productions.

2. Education and Training

- Simulation & Training: Immersive technologies for S&T in aviation, medicine, police and military, providing realistic scenarios for practice.
- Interactive Learning: Universities, Schools and museums to teach complex concepts through hands-on, engaging experiences.
- Cultural Preservation: Virtual recreations of historical sites or events allow users to explore and learn about history in an interactive way.



3. Art and Creativity

- Immersive Art Installations: to create interactive, multi-sensory experiences, where e.g. paintings become "alive".
- Digital Storytelling: to tell stories in innovative ways, blending visuals, sound, and interactivity.



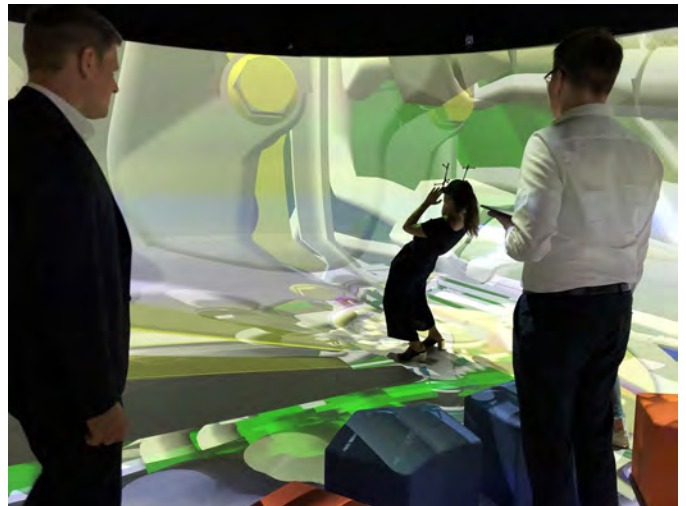
4. Marketing and Retail

- Brand Experiences: to create memorable, interactive brand experiences for customers.
- Virtual Showrooms: Retailers offer virtual shopping experiences where customers can explore products in a 3D environment.
- Product Launches: to create buzz around new products through engaging, interactive presentations.



5. Healthcare and Therapy

- Medical Training: to help medical professionals prepare for, test and practice surgeries and procedures in a risk-free environment.
- Mental Health Therapy: VR is used for exposure therapy, relaxation, and treating conditions like PTSD or anxiety.
- Rehabilitation: to assist in physical therapy by making exercises more engaging and measurable.



6. Work and Collaboration

- Virtual Meetings: to enable remote teams to collaborate in virtual environments that mimic real-world offices or creative spaces.
- Design and Prototyping: Architects, engineers, and designers use immersive spaces to visualize and test their creations in 3D.

7. Tourism and Exploration

- Virtual Travel: Immersive spaces allow users to explore distant locations or inaccessible sites (e.g., underwater or space) virtually.
- Cultural Experiences: Users can experience festivals, landmarks, or cultural events from around the world without leaving their location.

8. Research and Development

- Scientific Visualization: to help researchers to visualize and navigate complex data, such as molecular structures or astronomical phenomena.
- Behavioral Studies: to study human behavior in controlled, yet realistic settings.

9. Real Estate and Architektur

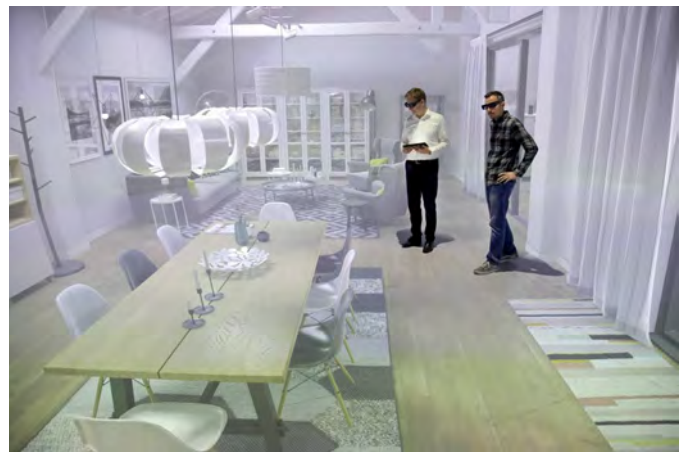
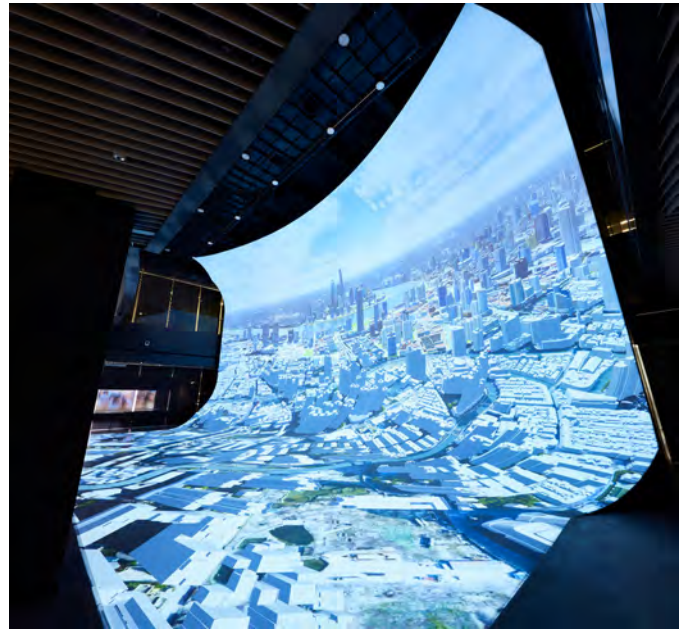
- Virtual Property Tours: potential Buyers can explore properties remotely through immersive 3D tours or in CAVEs.
- Architectural Visualization: Clients can walk through virtual models of buildings before they are constructed.



Turnkey Display Solutions for Simulation, Training, Immersive XR-Spaces, XR-CAVEs, Media Based Attractions

project: syntropy offers turnkey projection- / dvLED-based display solutions, tailor-made AV systems and full-service throughout the entire project:

- PROJECTION- OR dvLED-BASED SYSTEMS
 - DEVELOPMENT
 - ENGINEERING
 - CONSTRUCTION AND INSTALLATION
 - AFTER SALES SERVICE
 - Training
 - Maintenance and Support
 - tailored Service-Level-Agreements (SLA)
 - Spare Parts Supply
- VISUAL SOLUTIONS FOR SIMULATION & TRAINING
 - FMS FULL-MISSION-SIMULATORS - FFS FULL-FLIGHT-SIMULATORS - CT COCKPIT SIMULATORS - HELICOPTER SIMULATORS - COMBAT SIMULATION - JFST ACTION TRAINERS - JTAC TRAINERS - ATM TOWER SIMULATORS - DRIVING SIMULATORS - SHIPS BRIDGE SIMULATORS - INDUSTRIAL SIMULATORS - RESEARCH SIMULATORS
- MEDIA BASED ATTRACTIONS
 - XD FLYING THEATRES - XD 360° & 720° ATTRACTION DOMES, CINEMAS & GLOBES - INTERACTIVE VISITOR ATTRACTIONS - MOTION THEATRES - DARK RIDES - MEDIA FACADES - IMMERSIVE TUNNELS & IMMERSIVE ENVIRONMENTS - PLANETARIUMS - PROJECTION MAPPING
- DIGITAL TWIN XR-SPACES (e.g. UDT Urban Digital Twins)
- XR-CAVE - XR VOLUMES
- SYNTOUCH MULTIUSER RADAR TOUCH
- MIXED REALITY ENVIRONMENTS & TRACKING TECHNOLOGY DEVELOPMENT



Authorized Dealer:

Leading Integrator of next Generation dvLED- and Projection-based XR-CAVE & XR-Spaces

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