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Technical Specifications of Immersive Virtual Reality System

Specifications:

An immersive virtual reality system (IVRS) provides an artificial environment with a real-world feel to its users. It is commonly known as Cave Automatic Virtual Environment (CAVE). The IVRS that Indian Institute of Technology (IIT) Bombay intend to setup should have the following specifications:

Sl.#	Item	Technical details	Qty
1.	3D virtual reality projection system	Active Stereoscopic Single-chip DLP laser projector with: • Resolution: Minimum 2,560 x 1,600 @ 120 Hz • 3D technology: Active • Brightness: Minimum 9000Lumens • Light source: LASER • Life: Minimum 35,000 hours • Projector lens: FLD+ Short Focus 0.8 - 1.21: 1 • Projector mountings: 1 roof and 3 floor mounting • Operating voltage: 220V	4
2.	Projection screen	4 sided projections (left, front, right and floor) with widest possible viewing angle and: • Type: Flexible scratchproof, wet washable, flame retardant hot-spot or glitter free screen • Size: Minimum 2m x 3 m • Peak gain: 1.0 for front and side screens 1.1 for floor projection screens • Screen mountings: Fixed mountings for front and side screens Movable floor projection screen • Mirror rig: For front and side screens (if needed) • Temperature Stability: 0 to 70 deg. C	1 setup

Sl.#	Item	Technical details	Qty
3.	Display management system and image generators	Computing system with: • Processor: Speed – minimum 3.6GHz and 3.9GHz Turbo; Core – minimum 4; Cache – minimum 8.25MB • RAM: Minimum 128 GB • Storage: Minimum 1 TB SSD • Graphics: NVIDIA Quadro RTX A6000 or better • Appropriate Sync card for a CAVE setup • Monitor: Minimum three 27-inch LED monitors • Operating system: At least the latest version of Microsoft OS • Input/Output: For the projectors, monitors, wireless keyboard, wireless mouse, and master-slave setup • Operating voltage: 220V • UPS with minimum 15 minutes backup	As required
4.	Audio system	AVR with digital signal processor and: • 8 surface mount speakers • 1 subwoofer • 4 multichannel amplifiers	1 set
5.	Cables and display related accessories	• Video extenders • Video and CAT6-network cables • Optical fibre cable and Audio cable • Fast ethernet smart switch • Equipment rack • Power adopters	As required
6.	3D optical tracking system	Includes: • At least 4 nos. of 3D optical tracker camera • Navigation device with head tracker • 2 pairs of Finger tracking data gloves • 15 nos. of 3D glasses and at least 1 RF Emitter • Eye tracking solution integration kit	1 set

Sl.#	Item	Technical details	Qty
7.	Software	The software with perpetual license should have the following capabilities: • Integrating tracking device information • Video projection interfacing and display software supporting high-quality 3D stereo projections on four sides with appropriate blending, high-resolution quad-buffer stereo, desktop head mount display. • Simultaneous interactions between IVRS (or CAVE) and multiple head mount displays. • Recording of data captured from tracking systems, head mount displays and connected driving simulators. • Support a mechanism for data integration from major CAD and geospatial terrain data sources including but not limited to Unity applications, Solidworks, 3DS Max, NX Unigraphics and CATIA. • Allow fast development of complex 3D scenarios and provide application programming interfaces (APIs) and standard development kits (SDK) with possible publishing of non-commercial applications (exe) files. • Compatibility: At least the latest version of Microsoft operating system.	As required
8.	Installation and training	The setup should be installed at the site in IIT Bombay with minimum 1-year warranty on parts and service and training for operations and troubleshooting technical errors. Further, a documented manual on operations and troubleshooting for future use must be provided after the installation of the setup.	As required

The Cubic Immersive Virtual Reality System at IIT Bombay would be used for research, education, and training. Detailed description of the various usage is provided in the document titled Usage of Cubic Immersive Virtual Reality System. The other devices and applications that would be integrated with the Cubic Immersive Virtual Reality System uses Sim Creator and 3D Unity in the Driving Simulators, and ArGIS and QGIS as GIS applications. The minimum required technical specifications are published in the Notice Inviting Tender. Vendors can select hardware and technologies that meet the minimum specification provided and satisfy the intended usages. During the technical evaluation interested vendors are expected to demonstrate capability by showcasing past

experience in delivering products with functionalities required for the intended usages indicated in the document.