



राष्ट्रीय आयुर्वेद संस्थान
मानद विश्वविद्यालय (डी-नोवो)
(आयुष मंत्रालय, भारत सरकार)
NATIONAL INSTITUTE OF AYURVEDA
Deemed to be University (De-novo)
(Ministry of AYUSH, Govt. of India)



Store:F1(21)/2022-23/Extension Of Virtual Reality Lab/Basic Module/Dept. of Sharir Kriya

Date:

Notice Inviting Expression Of Interest (EOI)

Extension Of Virtual Reality Lab/ Basic Module

NIA, Jaipur intends to extend the virtual reality lab/basic module with the vision of preparing two sets of all systems (Cell Physiology, Haemopoietic System, Nervous System, Cardiovascular System, Respiratory System, Digestive System, Skin, Musculoskeletal System, Excretory System, Endocrine System & Reproductive System) of human physiology along with their functional anatomy, physiology and applied aspect in the institute. EOI is invited from the eligible firms for extension of virtual reality based learning lab in the institute.

For more details contact Dr. Mahendra Prasad (9887315717) & Dr. Sarika Yadav (9467451607) the concerned officer and submit EOI in sealed envelope addressed to the undersigned. Last date for submission of EOI is 30-08-2023.

Sd/-

Vice Chancellor

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Extension of Virtual Reality Lab

A. HUMAN BODY

- a) Module should include an outside and inside view of the human body (Male and Female).
- b) It should include circulatory system with blood circulation around the body via heart, arteries and veins. Delivering oxygen and nutrients to organs and cells and carrying their waste products away.
- c) It should include the digestive system to showcase absorption of nutrients and removal of waste products via the gastrointestinal tract including mouth, oesophagus, stomach, intestine, rectum and anal canal.
- d) It should include a muscular system to show case the body to move using muscles. Individual muscle action their contraction and relaxation should be visible.
- e) It should include renal system to showcase kidneys filtering blood to produce urine and excretion of waste products.
- f) It should include respiratory system to showcase air into and out of the lungs to absorb oxygen and remove carbon dioxide up to alveolar level.
- g) It should include skeletal system showcase bones and joints maintaining structure of the body and its organs.
- h) It should include nervous system including parts and functioning of both CNS and PNS.
- i) It should include inside and outside view of both male and female reproductive system.
- j) It should include the physiological functioning and positions of all endocrine glands and organs with detailed textual description.
- k) It should include the structure and function of the human skin.
- l) Cell physiology aims to understand the structure and physiological function of individual cells and how they interact with their environment.
- m) The hemopoietic system provides the regulated production of a complete complement of mature blood cells in the peripheral circulation, which includes neutrophils, eosinophil, basophils, erythrocytes, and megakaryocytes etc.
- n) There should be provisions to further alteration or development of the existing modules as per requirements and technical advice of the experts.

B. CELL PHYSIOLOGY

The cell physiology should include module on structure of the cells, arrangement of cell membrane in cell – fluid mosaic arrangement and membrane protein in cell membrane, structure of cytoplasm of cell, organelles in cytoplasm, Cytoskeleton of cell, detail description Nucleus & cell division.

C. HAEMOPOIETIC SYSTEM

haemopoietic System should include module on hematopoietic system, hematopoiesis, leukocytes and platelets, blood clotting, blood groups and applied aspect & immunity.

D. NERVOUS SYSTEM

The nervous system should include- module of all types of nervous system (Central nervous system, Peripheral Nervous system & their parts) & Special Senses along with their anatomy and physiology with voice over and applied physiology.

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E. CARDIOVASCULAR SYSTEM

The cardiovascular system should include module on functional anatomy of the cardiovascular system, circulation and their regulation, nerve innervation of heart, properties of cardiac muscle, ECG and its presentation in different disease, cardiac cycle, heart Sound, heart Rate, blood pressure and cardiac output, Effect of exercise on cardiovascular system, examination of cardio vascular system & applied Aspect of cardiovascular system.

F. RESPIRATORY SYSTEM

Respiratory system should include anatomy & physiology of all organs of respiratory system. It also include pulmonary circulation, mechanism of breathing, exchange & transport of respiratory gases, regulation of respiration, pulmonary ventilation, pulmonary function test, artificial respiration, high altitude and space physiology in respiration, deep sea physiology in respiration, effect of exercise on respiration, effects of exposure to cold and heat & applied physiology of respiratory system

G. DIGESTIVE SYSTEM

The digestive system should include modules of Functional anatomy of digestive system, Gastrointestinal Hormones and secretion, Movements of Gastrointestinal Tract, Digestion of Carbohydrates, Proteins, Lipids, Absorption and Metabolism of Carbohydrates, Proteins and Lipids.

H. SKIN

Skin should include modules of all- Layers of skin, Appendages of skin, Color of skin, function of skin and applied aspect of skin.

I. MUSCULOSKELETAL SYSTEM

The musculoskeletal system should include classification of muscle (skeletal muscle, smooth muscle & cardiac Muscle) & their functional anatomy, muscular contraction, muscle tone & applied aspect of muscle. It also include classification & functional anatomy of the bone, mechanism of bone formation and bone resorption, applied aspect of bone.

J. EXCRETORY SYSTEM

The excretory system should include detailed anatomy, histology of Kidneys including nephrons, tubular system, Ureters, Bladder along with their physiology and applied aspect, detail description of nerve supply to excretory system and micturition reflex.

K. ENDOCRINE SYSTEM

The endocrine system should include gross and microscopic anatomy including detailed wall structure and cell type, histological features, development of gland & regulation of each gland in detail, all types of glands & their hormones, all disorders (hypo functioning & hyper functioning) of each hormone.

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L. REPRODUCTIVE SYSTEM

The reproductive system should include – modules of male reproductive organs & female reproductive organs & their anatomy along applied physiology with voice over and detailed description of spermatogenesis, fertilization, implantation, development of placenta and embryo, stages of labour, mechanism of labour, mammary gland and lactation.

HARDWARE AND SOFTWARE REQUIREMENTS

- Two sets of complete Virtual Reality support systems along with two sets of wireless head mounted display.
- Two sets of wall mounted TV Screens for display of Virtual reality modules along with necessary accessories.
- Virtual Reality (VR) Equipment (With latest available technology for virtual reality modules).
- Modules for Desktop based VR equipment (For Human Body, Cardiovascular System and Respiratory System) with provision to further development as per required by the institute.

Other Terms and Conditions

- Interested companies may present the detailed description of the proposal as per our requirements.
- Along with detailed proposal specifications of Virtual Reality (VR) Desktop and Desktop based Virtual Reality (VR) Equipment will be mandatory for the comparison with other proposal received.
- There will be a technical evaluation committee which will study all the proposal and shortlist the proposals which will be found suitable for technical bid.
- Demonstration of the modules before technical committee will be mandatory to qualify for the financial bid.
- Preference will be given to the companies those who have already developed modules and had served the Government sector previously.
- Bidder should have adequate experience in developing Virtual Reality Programme in field of medical education for which supporting documents needed to be enclosed with proposal
- Bidder has to submit audited financial statements of the last three financial years i.e. FY 2018-19, 2019-20 and 2020-21 for any government or private organisation.
- Prior Experience - Bidder should have executed or executing at least two similar projects in the last 5 years period prior to the bid submission date. Preference will be given to the bidders who had worked for government sector earlier.
- In case of Completed project - copy of work order+ Completion Certificates from client + Project Citation should be enclosed with proposal.
- Vendor has to demonstrate/share/present their relevant past work showing their team strength/ capability/capacity. It will be criteria for technical evaluation for the TEC (Technical Evaluation Committee) prior to opening the Financial Bid of the vendors submitting the bids.

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- Financial bid of those bidders whose Techno-commercial bid is accepted by the TEC will be opened and comparative statement will be prepared. The best acceptable bid will be decided upon the lowest price quoted by the particular bidder.
- Vendor has to submit the credit worthiness/bank guarantee issued by a bank/ a certified registered CA at least double to the cost of the project.
- Warranty: Vendor should provide at least 5 years of hardware warranty along with 15 years of software warranty.
- Director, NIA reserves the right to withdraw/modify the requirement at any stage without any need to clarify as the case may be.

Remark

As per standard SOP other requirements may be included if any not covered above and deemed necessary as the case may be.

Proposal for extending Virtual Reality Based Learning Lab in National Institute of Ayurveda, Jaipur

In the last decade, the rapid innovation in the technological world has had a major impact on the human-computer Interaction (HCI). The education sector has also realized its significance and has made various attempts to use it to their advantage. Various technologies have been introduced to enhance the learning, engagement of the student, and their assessments, aiming to enrich the quality of education. The motivation of students to effectively learn plays an effective role is one of such key priorities for educational systems.

Virtual Reality (VR) technologies have transformed the landscape of HCI in recent years by offering new and unique viewpoints on the core goals of training and education in the medical field. VR creates a sense of immediacy and control through its immersive display which puts the user into a simulated environment that looks and feels to a certain extent like the real world. This immersion, in turn, engages the user by attaining their attention to the fullest resulting in better learning outcomes.

In medical studies, both theoretical and practical expertise are having a vital role. Repetition of practical can improve young doctor's professional competency. Immersive technologies were found best for medical students in both learning motivation and learning competency. Medical Students and education may introduce VR and new learning methodology for curriculum learning.

Some of the Key features of Virtual Reality Labs have been listed below:

1. It uses state of the art technology (VR) for interactive and immersive exploration of concept that the students learn via Textbooks.
2. It enables the student to visualize, explore and interact with the concept/model being taught.
3. The models and its corresponding parts may also be explored.

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4. The VR based visualization enables the students to have a 360 degree view of the concept/model
5. The details of each of the components in the model, facilitates learning while visualizing the model in totality.

Keeping in view above background it is proposed to extend virtual reality lab in our Institute in a phased manner.

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Departmental Technical Committee
Department of Kriya Sharir
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Extension of Virtual Reality Lab: Desired module software Specifications

S. No.	Properties	Desired specifications
1	Texture	Detailed textures with similar visual details as original organ. Reference: https://prnt.sc/Xnzjfw_ZjhFY
2	Correctness and detailing of models in 3D	Detailed model with more closer resemblance to original organ. It will also contain a basic interior details and additional detailing will be added via textures only. For example, a more accurate shape of heart with proper curves and shapes so that it doesn't look lowpoly or edgy.
3	Effects	Use of 2D particles and basic 3D shapes to show the process. Example, showing the flow of blood with red and blue dot particles instead of arrows.
4	Interaction Design	Addition to Category 1, we can show exploded model view (showing individual part of object as a separate object), XRay representation of object.
5	Inside view of organs	Basic so that X-Ray view looks detailed.
6	Simulation	Simple simulation things, like controlling the process of object, animation speed, etc.
7	Difference and simulating various health conditions	N/A
8	Additional medical equipments in-relation to the organ/part concerned wherever applicable	Various parameters related to an organ can be displayed in a simple UI or graph instead of showing complete medical instrument.
9	Contrast Analysis	N/A
10	SFX and depth coverage	Available
11	Supported functionalities	Functionalities can be increased as per the hardware selected
12	Platform Support	PC based VR only
13	Quality Settings	Output quality can be modified by the user and can be auto set based on the hardware

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S. S. S.
18/7/2023

Extension of Virtual Reality Lab:

Picture Parameters	Desired Specifications
Polygon	30000 & above
Sculpting	Available
Detailing	Available
Texture Process	upto 2048 k
Baked Lightning	Available
Realtime Lightning	N/A
Texture Maps	
Albedo	Available
Normal	Available
Ambient Occlusion	Available
Height	Available
Metallic	Available
Roughing	Available
Omission	Available
Sub Surface Scattering	Available
Particle Effect	Available

Video	Desired Specifications
Resolutions Quality	Full HD
Height	1080px
Width	1920px

Sound	Desired Specifications
Recorder Voice-over	128kbps
Voiceover	Available
Sound effects	Available
Screen Transitions	Available

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VR Modules Supporting System

Processor	Intel Core i9-10 Gen Processor
Memory	Min 32 GB DDR4 RAM
Graphics	Nvidia GeForce RTX 2070 with 8GB
Network	Min one 10/100/1000 interface
Audio	Integrated Sound and Audio
Operating System	Microsoft Windows 10
Keyboard & Mouse	Min 104 keys OEM standard keyboard & two button OEM standard mouse
Warranty	3 Years On-site warranty

Head Mounted Display - Wireless

VR Category	All-in-one VR
Tracking	Insight inside-out tracking
Input	Two Touch controllers
Resolution	1832x1920 per eye
Display Panel	Fast-switch LCD
Audio	Integrated positional audio
Processor	Qualcomm® Snapdragon™ XR2 Platform
Battery Life	2-3 hours
Storage	128GB or 256GB
Supported Usage Modes	Seated, standing, room scale
Glasses Friendly	Comfortable to wear with glasses or RX inserts

Television

Display	
Screen Size	94" to 100"
Resolution	3,840 x 2,160
Video	
Picture Quality	4K
PQI (Picture Quality Index)	2200-2500
HDR (High Dynamic Range)	HDR
HDR 10+	Support
Contrast	Mega Contrast
Color	Dynamic Crystal Color
Brightness/Color Detection	Brightness Detection
Audio	

Dolby Digital Plus	Yes
Adaptive Sound	Yes
Q-Symphony	Yes
Sound Output (RMS)	20-40W
Speaker Type	2-6 CH
Bluetooth Audio	Yes
Smart Service	
Operating System	Atleast Tizen™
Bixby	US English, UK English, India English, Korean, French, German, Italian, Spanish, Portuguese (features vary by language)
Multi Voice Assistant	Yes (India Only)
Google Assistant Built-in	Yes (India Only)
Works with Google Assistant	Yes (India Only)
Works With Alexa	Yes (India Only)
SmartThings App Support	Yes (India Only)
Universal Guide	Yes (India Only)
Gallery	Yes
Smart Feature	
Mobile to TV - Mirroring, DLNA	Yes
Sound Wall	Yes
Ambience	Ambient Mode
Easy Setup	Yes
App Casting	Yes
Bluetooth Low Energy	Yes
WiFi Direct	Yes
TV Sound to Mobile	Yes
Sound Mirroring	Yes
Wireless Dex	Yes
Cloud Service	Microsoft 365
Differentiation	
Tune Station	Yes (India)
Auto Hotspot Connect	Yes (India)
S-Share	Yes (India Only)
Auto Data Backup	Yes
Dongle Compatibility (3G / LTE / WiFi)	Yes (India Only)
Analog Clean View	Yes
Triple Protection	Yes
Tuner/Broadcasting	
Digital Broadcasting	DVB-T2
Analog Tuner	Yes
TV Key	Yes



Connectivity	
HDMI	3-5 Ports
USB	2-5 Ports
Composite In (AV)	1 Port
Digital Audio Out (Optical)	1 Port
RF In (Terrestrial / Cable input)	1/1(Common Use for Terrestrial)/0
HDMI A / Return Ch. Support	Yes
eARC	Yes
HDMI Quick Switch	Yes
Bluetooth	Yes (BT5.2)
Accessibility	
Accessibillity - Voice Guide	UK English
Accessibility - Learn TV Remote / Learn Menu Screen	UK English
Accessibility - Others	Enlarge / High Contrast / Multi-output Audio / Color Inversion / Grayscale / Sign Language Zoom / Slow Button Repeat
Power & Eco Solution	
Power Supply	AC220-240V 50/60Hz
Power Consumption (Max)	300 W
Eco Sensor	Yes
Package Weight	
Set Weight with Stand	56 - 60 kg
Set Weight without Stand	43 - 50 kg

Air Conditioner

PRODUCT SPECIFICATIONS	
Tonnage	2 Ton
Full Load Capacity (100%) [W]	6600-7000
Half Load Capacity (50%) [W]	3300-3500
Compressor Type	High EER Twin Rotary - BLDC
Refrigerant Gas	R32
Power Supply [V/Hz/Ph]	230 / 50 / 1 Phase
Full Load Power (100%) [W]	1850-2000
Half Load Power (50%) [W]	682 -700
Condenser Coil	Copper
Connecting Pipe [Type]	Cu-Cu(12.7mm & 6.35mm)
PERFORMANCE	
Star Rating	5
Air Flow Volume - Indoor [CMH]	1400/1330/1200/1100
Noise Level - Indoor [..dB(A)]	(51)49/46/44

Prepared
18/7/2023

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ISEER	4.51
Max operating Ambient Temp Range [Deg C]	52 C
Wide Operating Voltage Range [V]	145~270
OPERATION	
Operation	LCD Remote
LED Display	Yes

Floor Foam

Material	Polyurethane Foam
Density	20 kg/m ³ - 40 kg/m ³
Thickness	8-12 mm

Floor Carpet

Colour	Dark
Pattern	Solid
Shape	Rectangular
Material	Acrylic
Pile Height	Low Pile
Grip	Anti-slip

Students Chair

Material	Alloy Steel
Included Components	1 Foldable Study Chair
Furniture Finish	Powder Coated
Size	Standard
Maximum Weight Recommendation	100-120 Kilograms
Item Weight	6-10 KG

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Professors Chair

Style	Modern
Special Feature	Perfect support for your back and neck Height adjustment - Heavy duty pneumatic gas lift. 2D Lumbar Support Tilting Mechanism Breathable Meshback 2d Headrest Alloy Steel Chrome Plated Base
Material	Plastic
Pattern	HIGH Back Office Chair
Frame Material	Plastic
Back Style	HIGH Back
Weight	15-18 Kilograms
Maximum Weight Recommendation	100 Kilograms, 125 Kilograms
Seat Material Type	Fabric
Furniture base movement	Swivel
Indoor/Outdoor Usage	Indoor
Mattress Comfort	Ergonomic
Fill Material	Fabric
Size	Standard
Color	Black
Primary material	Plastic
Capacity	Standard

Computer Desk

Shape	Rectangular
Desk design	Computer Desk
Colour	White
Style	Modern
Top Material Type	Engineered Wood
Finish Type	Textured
Special Feature	Ergonomic
Room Type	Office
Item Weight	20-30 Kilograms
Furniture Finish	Wood with metal stand

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Steel Almirah

Mounting Type	Over the Door
Style	Without Mirror
Included Components	1 wardrobe
Size	2 Door
Number of Doors	2
Number of Drawers	1
Shape	Rectangular
Back Material Type	Steel
Frame Material	Engineered Steel
Steel Gauge	20-25 Gauge
Paint Type	Powder Coated

Shoe Rack

Material	Metal
Recommended Uses for Product	Shoes
Installation Type	Free Standing
Special Feature	Adjustable
Finish Type	Premium

Inverter

Inverter Capacity	90-100 Volt, Capacity - 5000-6000 VA, Max. Bulb Load - 4000-5000 watt
Battery Capacity	Voltage - 12 Volt, Capacity - 150 Ah
Key feature for Inverter	Intelligent battery charging mechanism with adaptive battery charging control technology
Key feature for Battery	Highly efficient and ideal for heavy duty application with excellent overcharge tolerance, superior performance during long and frequent power cuts and minimum maintenance
Safety	MCB for protection from Input main, Auto over-load handling capacity, Bypass switch for supplying output directly from grid in case of Home UPS fault
Warranty	For Inverters - 24 months and for battery - 36 months

Roller Blinds

ROOM DARKENING BLINDS FOR WINDOWS:	Textured fabric with 100% room darkening effect, thermal insulated, good for UV protection and maximum privacy protection.
Mounting Type	Inside Mount, Outside Mount

Rechargeable Batteries Charger with Batteries

Rechargeable Battery	1500-3200 mAh
Batteries	8 AA batteries
Voltage	240 Volts

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Others

1. Connectors to connect devices with the System
2. Civil Work: Fall Ceiling, Paint, Flooring, Installation, Electric & LAN work & Etc.

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