



“VISION PRO: REVOLUTION TO EXTENDED REALITY IN PROSTHODONTICS”

Prosthodontics

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ABSTRACT

"Learn by doing" is one of the oldest techniques of learning. Humans have always learnt by doing, and it is still one of the most efficient ways to combine content and context. Experiential learning aids in providing perspective to a topic being studied. Experiential learning is effective, but it can be expensive and dangerous. Modern technology can deliver the usually expensive experiential learning at a lower cost. Virtual reality training simulators allow students to repeatedly perform procedures on virtual patients, which can help them improve their skills and reduce potential of errors. As Virtual reality, Augmented Reality, And Mixed Reality technology improve, we may expect greater creativity and effective immersive learning applications. These innovations have the ability to completely alter training, education, and professional improvement, making education more engaging, accessible, and beneficial for everyone.

KEYWORDS

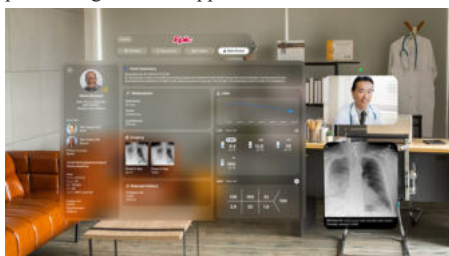
VR-virtual reality, AR- augmented reality, MR-mixed reality, CAD CAM-computer-aided designing and computer-aided manufacturing

INTRODUCTION

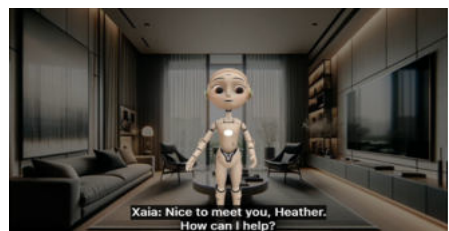
The Vision Pro, a spatial computing device that combines AR and VR technology. Cinematic Vision offers individuals an opportunity to fully immerse themselves within an environment of photographic renderings of the human head and neck anatomy.

Vision Pro fully captures the three-dimensional experience while also offering significant flexibility for solo use. Siemens Healthineers' Cinematic Vision app, powered by Metal and the M2 processor, enables dentists and medical professionals, students, and patients to watch realistic interactive holographic images of human tissues captured through diagnostic imaging in their real-world environment.

With the Epic Spatial Computing Concept, clinicians may use gestures to participate in charting, encrypted chat, and In Basket processes with Vision Pro, creating new opportunities for efficiency and interaction in a geographic setting for future applications.



A huge advancement over earlier technologies, Vision Pro's breath-taking display provides a doorway into a world of immersive, interactive behavioural health care. Utilising Xaia, we create an immersive therapy that is both extensively personal and captivating by utilizing every pixel of its exceptional resolution and vibrant colour range.



About the device

- The mixed reality headset it creates, the Vision Pro

- With the release of development tools for vision OS, the capabilities and limitations of the operating system have been even more apparent.
- The realization that so many people use voice control while alone, lounging on sofas or in chairs, could be related to the antisocial aspects of these gadgets.



- A continuous, colored front panel encircles the wearer's eyes with the Vision Pro.
- The headset has a "light seal" that is magnetically fastened to prevent outside light from seeping in.
- The Vision Pro has a button, digital crown, and readily replaceable band around the back for calibration, navigation, and fine-tuning.
- There are two display panels on the Vision Pro.
- The user interface is constantly visible thanks to a special 3D lens, and functionalities like HDR and "wide color" purport to deliver enhanced images.
- Leveraging "audio ray tracing," embedded earplugs allow users to optimize sound in a specific region by analyzing the acoustic characteristics of their surroundings.
- While downward-facing cameras on the outer edges of the chassis observe a wearer's hands, infrared cameras within the Vision Pro track their eyes.
- Lidar sensors, a third type of sensors, are utilised to track the positions of individuals and objects in real time around the Vision Pro.

Vr And Ar In Prosthodontics:

Applications for virtual simulation provide a "top-up" of information to the real world, creating new avenues for both education and the therapeutic setting.

With augmented reality (AR), a computer-generated virtual world is superimposed over the real world to provide a sensory experience that can be interacted with VR, on the other hand, is a man-made, computer-generated simulation of a real-world setting or circumstance. The main way it immerses the user is by stimulating their vision and audience in real-time, giving them the impression that they are actually experiencing the virtual world. The following

fundamental functions are the foundation of a successful AR/VR system and must be intimately interwoven with one another to function: sources of both virtual and real data, tracking, registration methods, and processing methods for visualisation, perceptual locations, and mechanisms for feedback.

In the near future, the full potential of AR/VR technology in dentistry will become apparent due to the ongoing advancements in IT technology.

Computer-aided design and computer-aided manufacturing (CAD/CAM) computer simulations and three-dimensional (3D) images are gaining significant traction and showing enormous promise.

Vision Pro: Ready for The field of dentistry?

Or let's put it in this way, is dentistry ready for Vision Pro?

In short, NO, as we can all guess. Not at this moment, anyhow. However, we have stated this about nearly every significant technological advancement in the last 20 years.

AR/VR-applications are of increasing interest and importance in dental under- and postgraduate education offering interactive learning concepts with 24/7-access and objective evaluation

So let's brainstorm for a minute together: we can identify three potential scenarios for this technology in dentistry.

1. First, is education!

The immersive experience is incredible. The days of scattered learning and static textbooks are long gone. This is the age of interactive, immersive experiences that don't care where you are in the world. Thereby, I can absolutely envision an implant course being taught in virtual reality, with a speaker outlining each step on one screen while you view the actual surgery on the other (or the main screen).

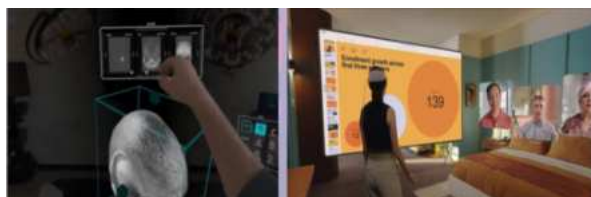


Dental students can precisely dissect virtual teeth, practice complex procedures such as root canal treatments or tooth preparations in a safe environment, and receive real-time feedback from teachers via spatial audio and haptic feedback features.

This greater engagement and understanding will result in better-prepared, more confident medical professionals.

Second, guided or assisted dentistry

Vision Pro enables unprecedented precision and personalisation in prostheses design. Consider a prosthodontist putting a patient's X-ray onto a 3D model in real time, developing and customising the prosthetic to properly fit their individual anatomy. This will significantly enhance the prosthetic's fit, usefulness, and comfort. The ability for real-time collaboration in the virtual environment brings up new possibilities. Dental practitioners from different regions could collaborate to design and modify restorations, encouraging knowledge sharing and potentially leading to better outcomes.



Dental CAD/CAM technology Revolution:

Vision Pro has the ability to completely transform dental CAD/CAM design. Imagine dentists and technicians visualizing a patient's oral cavity in spectacular detail utilizing 3D scans and X-rays superimposed on virtual models. They can then create personalized crowns, bridges, and implants with unparalleled precision and aesthetics, resulting in a perfect fit and natural-looking restoration. This technology can also improve the entire dental workflow, decreasing errors and turnaround times, resulting in a more efficient

and personalized experience for patients.

The ability to effortlessly integrate this immersive technology with existing CAD/CAM tools might dramatically impact the design process, bringing unique advantages:

- Enhanced Spatial Understanding
- Accuracy and Customization
- Collaboration design promotes
- Efficiency and streamlining.

It marks a huge step forward, promising improved precision, customization, collaboration, and efficiency in the design of dental restorations.



Third, consider the patient experience:

Before visiting an office, a patient might view a Spatial Video of your business and click on specific technology, such as Cerec or Laser, to learn more about it.

Vision Pro has enormous potential; yet, it is critical to recognize potential problems. Accessibility, data privacy, and seamless interaction with current educational and healthcare infrastructure are all critical factors. However, with careful planning and joint work, these obstacles may be overcome, opening the way for a future in which Vision Pro empowers not only individuals but also the entire healthcare ecosystem.



CONCLUSION:

This cannot get much better! A digital crown refers to the main button, often known as the "Home View". We can't seem to get away from crowns! Could we?

This clever technology that has been introduced into dentistry can be used effectively to reduce workload and improve the quality of care offered.

Vision Pro represents a huge advancement not only in technology, but also in our ability to study, heal, and create. When we accept this transformational instrument, we open the door to a future in which education crosses boundaries, prosthetics become extensions of ourselves, and the possibilities for healthcare innovation are endless. Let us seize this chance to reinvent the future of dental and medical education, as well as prosthetic design, so that everyone has access to the finest possible treatment and learning experiences.

REFERENCES:

1. <https://www.gartner.com/en/information-technology/glossary/immersive-learning-environments-iles>
2. <https://www.precedenceresearch.com/immersive-technology-market#:~:text=The%20global%20immersive%20technology%20market,22.3%25%20from%202023%20to%202032.>
3. <https://www.cedars-sinai.org/newsroom/first-accredited-continuing-medical-education-course-filmed-in-vr/>
4. Apple Vision Pro unlocks new opportunities for health app developers – Apple
5. <https://www.linkedin.com/pulse/learning-without-limits-apple-vision-pro-future-immersive-dar-19mvf>