



AI Integration Elevates Efficiency in Smart Operating Rooms

Background

With the rapid advancement of technology, upgrading traditional operating rooms to smart operating rooms has become a global trend in the medical industry. In collaboration with Advantech, a major international medical equipment manufacturer has developed a visualization solution for operating rooms. Using Advantech's USM-500 medical-grade edge AI computer, they captured and annotated imaging data from various medical devices within the operating room. This assisted clinical personnel in quickly assessing patient conditions while enabling the transmission of operating room visuals to other hospital systems and devices for applications like monitoring, remote consultations, and video teaching. These advancements significantly enhance medical efficiency and patient safety.

AI Application Trends Driving Hardware Upgrades in Smart Operating Rooms

The manufacturer, originally specializing in medical endoscopy technology, later expanded into integrated smart operating room solutions. In recent years, they adopted AI technology into their systems, enabling the automation of tasks such as lesion marking and color enhancement. This helps surgeons make faster, more informed treatment decisions.

Previously, surgeons relied solely on their expertise to identify lesions from endoscopic images, which was time-consuming and highly dependent on the experience of each individual surgeon, creating an inconsistent variety of care. With their new smart operating room system, AI now automatically highlights potential abnormalities or suspicious tissues, reducing the workload for surgeons and improving diagnostic accuracy.

However, as software upgrades progressed, the manufacturer realized their existing hardware could not meet modern AI computing demands, which continue to increase each year at an unbelievable pace. They required high-performance hardware, and Advantech's USM-500, equipped with a built-in GPU and image capture card, which proved ideal for AI image processing. Its PCIe expansion slots and medical-grade power supply also make it

well-suited for medical applications, cementing its position as their preferred choice.

Jerry Hsiao, a product manager at Advantech, highlighted that the USM-500 utilizes NVIDIA RTX 4000 and RTX 4000 ADA GPUs. In future software upgrades or when larger-scale medical imaging is needed, Advantech can swiftly integrate higher-level GPUs and image capture cards into the USM-500, ensuring seamless hardware upgrades without additional costs or delays.

As an NVIDIA Elite Partner, Advantech resolves system performance issues in collaboration with NVIDIA, having pre-integrated and validated NVIDIA GPUs across various series. This flexibility allows them to provide comprehensive hardware support and tailor solutions for smart medical applications.

Additionally, as part of medical equipment, the USM-500 prioritizes compliance with medical standards during component selection. For example, its medical-grade power supply exceeds consumer-grade specifications in stability, current resistance, and static electricity tolerance, ensuring safety and reliability.



Comprehensive Support, Brand Value, and Customization to Optimize Customer Systems

End-to-End Support from Development to Maintenance

Advantech offers comprehensive support, from product development to after-sales maintenance. With the medical device manufacturer headquartered in the US, Advantech's North American team maintains weekly contact, understanding requirements, monitoring progress, and conveying feedback to Taiwan's headquarters for prompt adjustments. With 27 operational locations globally and three manufacturing centers, Advantech provides localized support wherever the client's facilities are based.

Brand Value Established Through Global Case Studies

Advantech has been deeply invested in smart healthcare for years, continuously updating its designs to meet market needs and amassing successful global applications. This has built a strong reputation in the smart healthcare sector, facilitating trust among medical clients.

Three Key Customizations to Meet Client Needs

Custom Image Capture Card

Integration: Advantech integrated the manufacturer's specified capture card into the USM-500, conducting extensive testing to ensure compatibility. Continuous communication with the client's software team ensured smooth operations for end users.

Medical Certification and Custom

Manuals: Despite the USM-500's compliance with global standards like IEC-60601, unique specifications required re-certification. Advantech dedicated months to coordinating with third-party agencies, securing certifications efficiently.

Fan Noise and Speed

Optimization: Balancing fan speed for cooling during high AI processing without disrupting operating rooms was a challenge. Advantech optimized fan parameters through BIOS adjustments, achieving the perfect balance between performance and usability.

Key Features



- Easily reposition the touch monitor next to the patient for improved collaboration.
- A single lightweight USB-C cable reduces clutter and simplifies installation.
- High-definition video provides clear images for accurate decision-making.
- Real-time video transmission eliminates delays during surgeries.
- Designed for high luminance, ensuring visibility in surgical environments.
- Simplified cable management allows staff to focus on patient care.