

Optimizing Patient Safety with HOOBOX SADIA

The HOOBOX SADIA system leverages AI technology to help proactively prevent injuries and associated expenses.

hoobox

About HOOBOX

HOOBOX is a healthtech organization that aims to improve the quality of patient care and the efficiency of hospitals, using technology to automate processes and improve communication. Their mission is to enable artificial intelligence and data analysis technologies for hospitals to help improve their processes and avoid failures that put human lives at risk. To decrease wait times and increase hospital net promoter scores, HOOBOX offers intelligent interaction modules explicitly designed with the patient and healthcare professional's journey in mind.

Hospital Falls: A Costly Matter for Patients and Institutions

Currently, nurses and hospital staff are navigating a landscape of heightened patient expectations, battling burnout due to extended hours and increased workloads amidst a profound staffing crisis plaguing the healthcare sector. A survey by AMN Healthcare reveals that an overwhelming 94% of nurses perceive a moderate to severe shortage of nursing staff in their regions¹. This scarcity, coupled with limited resources and disconnected departments, compels nursing teams to juggle multiple responsibilities. Despite their core mission to deliver top-tier patient care, nurses find themselves inundated with patient requirements, from urgent health concerns to basic needs like hydration and nutrition, all without sufficient support from their institutions. This predicament hampers the efficient management and fulfillment of inpatient care, putting patient safety at risk.

Patient falls stand out as a particular safety concern. Globally, approximately 2% of individuals admitted to hospitals have a fall at some point during their hospital stay, with 25% of these incidents leading to injury, and about 10% causing serious harm. Annually, this accounts for nearly one million patients suffering from falls in hospitals². The repercussions extend beyond immediate health and safety, inducing longer hospital stays, reduced quality of life, and in some cases, increased mortality rates. Economically, the impact is stark:

- Both non-injurious and injurious falls are associated with estimated cost increases of over \$35,000³.
- Falls lead to an average extension of 6.3 days in hospital stays⁴.
- Hospitals risk facing penalties or receiving reduced reimbursements from insurers due to high fall rates⁵.
- The potential for legal action further escalates the financial burden on healthcare facilities⁵.

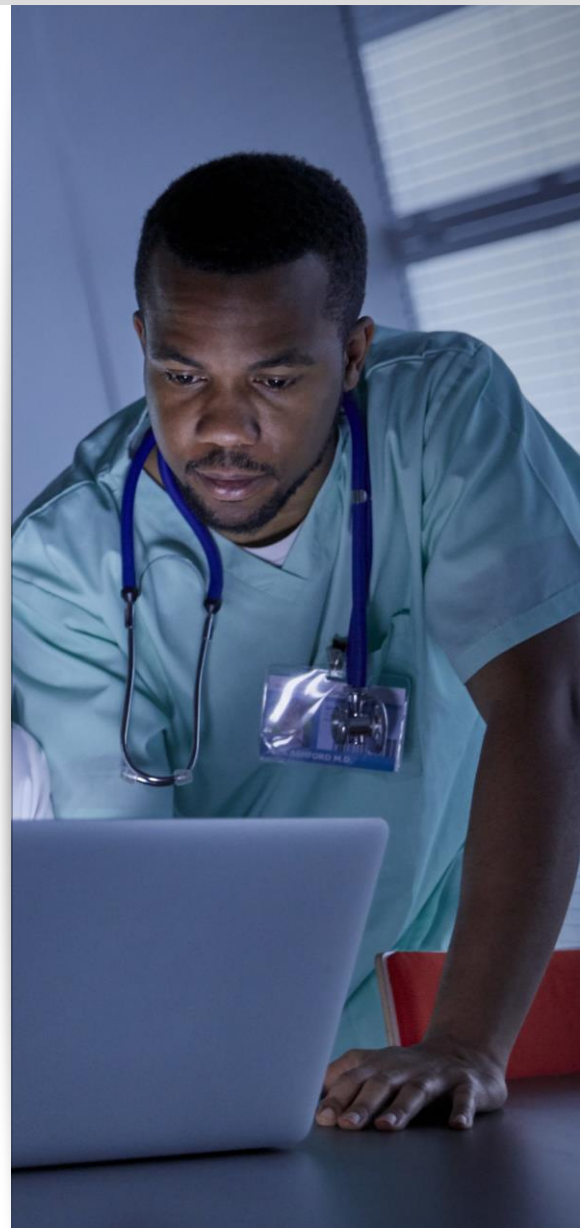
In response to this urgent issue, healthcare organizations are turning to cutting-edge technologies like artificial intelligence (AI) and computer vision to help proactively detect and prevent falls, marking the beginning of a new era in hospital fall prevention strategies. Enter HOOBOX SADIA, a digital solution acting as a 24/7 nursing assistant specifically designed to help prevent patient falls.

HOOBOX SADIA: An Innovative Leap towards Redefining Patient Safety

HOOBOX SADIA is a digital healthcare solution designed to act as a 24/7 nursing assistant to help prevent patient falls. Unlike traditional systems that merely alert staff after a fall has occurred, SADIA takes a proactive approach. Using advanced computer vision technology, SADIA anonymously detects patients with precision, even in crowded environments, and helps accurately monitor their movements. This new approach to patient monitoring allows healthcare facilities to implement more effective and targeted measures for enhancing patient safety.

Equipped with cameras installed above each hospital bed, SADIA employs AI and computer vision techniques to monitor a patient's movements, interactions with nearby objects, and even incorporates their health and treatment history into its analysis. This comprehensive monitoring allows SADIA to evaluate the risk of falls, proactively notify nursing staff of potential dangers, and consequently help enhance the existing preventive strategies within medical institutions. Patients may provide consent for healthcare monitoring by completing a consent form upon admission. They can withdraw consent at any point during their stay to ensure continuous informed consent. If a patient chooses to opt out of SADIA, the solution can be deactivated or turned off, or they can be placed in a room with no installed solution.

SADIA stands out in the healthcare market for its capability to discern among multiple individuals in a room with its focus on pose detection. Using standard cameras, adjusted for variables like ceiling height, SADIA delivers precision in monitoring. By offering continuous and detailed patient observation, SADIA not only helps anticipate potential risks but also ensures that healthcare providers can react promptly, aiding advancement in preventive healthcare measures.



Key Capabilities of the HOOBOX SADIA Solution



AI-powered Fall Risk Detection: SADIA employs AI algorithms to analyze patient posture, movements, and interactions within the hospital bed environment. By continuously monitoring these factors, the system can help detect early signs of potential falls.



Real-time Patient Monitoring: The solution provides round-the-clock monitoring of patients in the hospital bed environment, ensuring that patients are under constant supervision. When SADIA detects a high-risk situation, it promptly alerts the nursing station, enabling timely intervention to help prevent falls and ensure patient safety.



Scalable Computer Vision Model: HOOBOX SADIA's computer vision model has been optimized using the Intel® OpenVINO™ toolkit, achieving a balance between processing time and precision. This optimization allows the system to analyze more patients and beds simultaneously, enhancing its scalability and applicability in busy hospital settings.

Intel® Technology Helps Optimize the HOOBOX SADIA Solution for Healthcare Excellence

Intel technology enables HOOBOX to enhance SADIA's performance and scalability to meet the rigorous demands of healthcare settings. Specifically, HOOBOX SADIA utilizes Intel® Xeon® Scalable processors, the OpenVINO™ toolkit, and Intel® Extension for PyTorch.

- **The OpenVINO toolkit** has been crucial in refining SADIA's processing speeds during inference phases while ensuring precision. This equilibrium allows the solution to simultaneously monitor more hospital beds and patients, boosting efficiency and cost-effectiveness.
- **The integration of Intel Xeon Scalable processors** into HOOBOX SADIA's framework elevates its computational efficiency and processing power. These processors are designed to handle complex, data-intensive tasks, making them an ideal choice for the demands of real-time healthcare analytics and patient monitoring. By leveraging the advanced capabilities of Intel Xeon Scalable processors, HOOBOX SADIA is able to analyze vast quantities of medical data—including images and real-time patient metrics—at high speeds. SADIA's protects data and privacy through data encryption, access controls, consent management, and regular audits. No personal data is stored; only metadata about positions, poses, and shapes is securely transmitted to generate alerts.
- **The Intel Extension for PyTorch** specifically tailors the PyTorch deep learning framework to leverage the full potential of Intel® architecture, resulting in faster computation times and more efficient data processing. For HOOBOX SADIA, this means that complex machine learning models can be trained and executed more rapidly, allowing for real-time analysis and monitoring of patients.

Intel technology boosts HOOBOX SADIA's capabilities, enabling faster, more efficient patient care and deeper operational insights in healthcare settings.

HOOBOX SADIA End Customer Benefits

Enhanced Patient Safety



HOOBOX SADIA takes a proactive stance in enhancing patient safety by alerting nursing staff to potential fall risks before they occur to help lower the rate of patient falls and related injuries. This preventative strategy helps foster a safer hospital environment and better patient outcomes. Unlike systems that detect falls post-occurrence, SADIA is engineered to identify early indicators of a potential fall, such as a patient attempting to rise from bed after knee surgery. This forward-looking approach enables SADIA to swiftly notify nursing stations of imminent risks, focusing on preemptive actions rather than the fall itself. The ability to anticipate and avert falls, rather than merely responding to them, distinguishes SADIA as a useful asset in bolstering patient safety and minimizing fall-induced injuries within hospitals.

Reduced Costs



Hospital falls can result in prolonged hospital stays, additional medical treatments, and escalated healthcare expenses. SADIA contributes to cost savings by helping to decrease the frequency of falls, thereby enabling hospitals to allocate resources more efficiently. The system's emphasis on optimizing inference is pivotal in its capacity to monitor a greater number of patients simultaneously. By refining its processing efficiency, SADIA can oversee an expanded array of patient beds in real-time, enhancing the system's scalability and its utility in the dynamic environment of busy hospitals. This focus on augmenting patient bed analysis capacity underscores SADIA's dedication to harnessing technological innovations to help improve patient care and safety.

Optimize Hospital Workflows



SADIA can distinguish between different professionals in a hospital bed setting based on their uniform colors. By accurately tracking the time spent by various teams at each bed, the system provides valuable insights into staffing patterns and needs, helping streamline workflows and patient care management.

Conclusion

HOOBOX SADIA represents an advancement in patient safety and fall prevention in hospitals. By harnessing the power of AI, computer vision, and Intel® technologies, the solution helps proactively detect and alert staff to potential fall risks, ensuring timely intervention and improved patient outcomes.

Hospital executives and IT coordinators are encouraged to explore the HOOBOX SADIA solution and witness firsthand how it can help revolutionize patient safety in their facilities. By implementing this innovative technology, hospitals can create a safer environment for patients, reduce fall-related costs, and enhance overall healthcare quality.

To learn more about HOOBOX SADIA and how it can benefit your hospital, please contact our team for a demonstration or further information.

Learn More

To learn more about the HOOBOX Solution visit:

- [HOOBOX Website](#)
- [HOOBOX SADIA Solution Page](#)

To learn about Intel® technologies visit:

- [OpenVINO™ Toolkit Product Page](#)
- [Intel® Xeon® Scalable Processors Product Page](#)
- [Intel® Extension for PyTorch Product Page](#)



Sources

1. [2023 Survey of Registered Nurses](#), AMN Healthcare, 2023.
2. [Preventing Falls in Hospitalized Patients: State of the Science](#), Clinics in Geriatric Medicine Vol 35(2), 2019.
3. [Cost of Inpatient Falls and Cost-Benefit Analysis of Implementation of an Evidence-Based Fall Prevention Program](#), JAMA Health Forum, 2023.
4. [Preventing Inpatient Falls With Injuries Using Integrative Machine Learning Prediction: A Cohort Study](#), NPJ Digital Medicine Vol 2(127), 2019.
5. [Medical Teams, a Quick Question: Are Any of Your Patients Currently at Risk of Falling Right Now?](#), HOOBOX, 2024.

Notices & Disclaimers

Intel technologies may require enabled hardware, software or service activation. No product or component can be absolutely secure. Your costs and results may vary.

Intel does not control or audit third-party data. You should consult other sources to evaluate accuracy.

Intel is committed to respecting human rights and avoiding causing or contributing to adverse impacts on human rights. See Intel's [Global Human Rights Principles](#). Intel® products and software are intended only to be used in applications that do not cause or contribute to adverse impacts on human rights.

© Intel Corporation. Intel, the Intel logo, Xeon, OpenVINO, the OpenVINO logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.