

Intelligent Image Analysis Solution for Medical Image Information Security and Personal Privacy Protection



INDEX



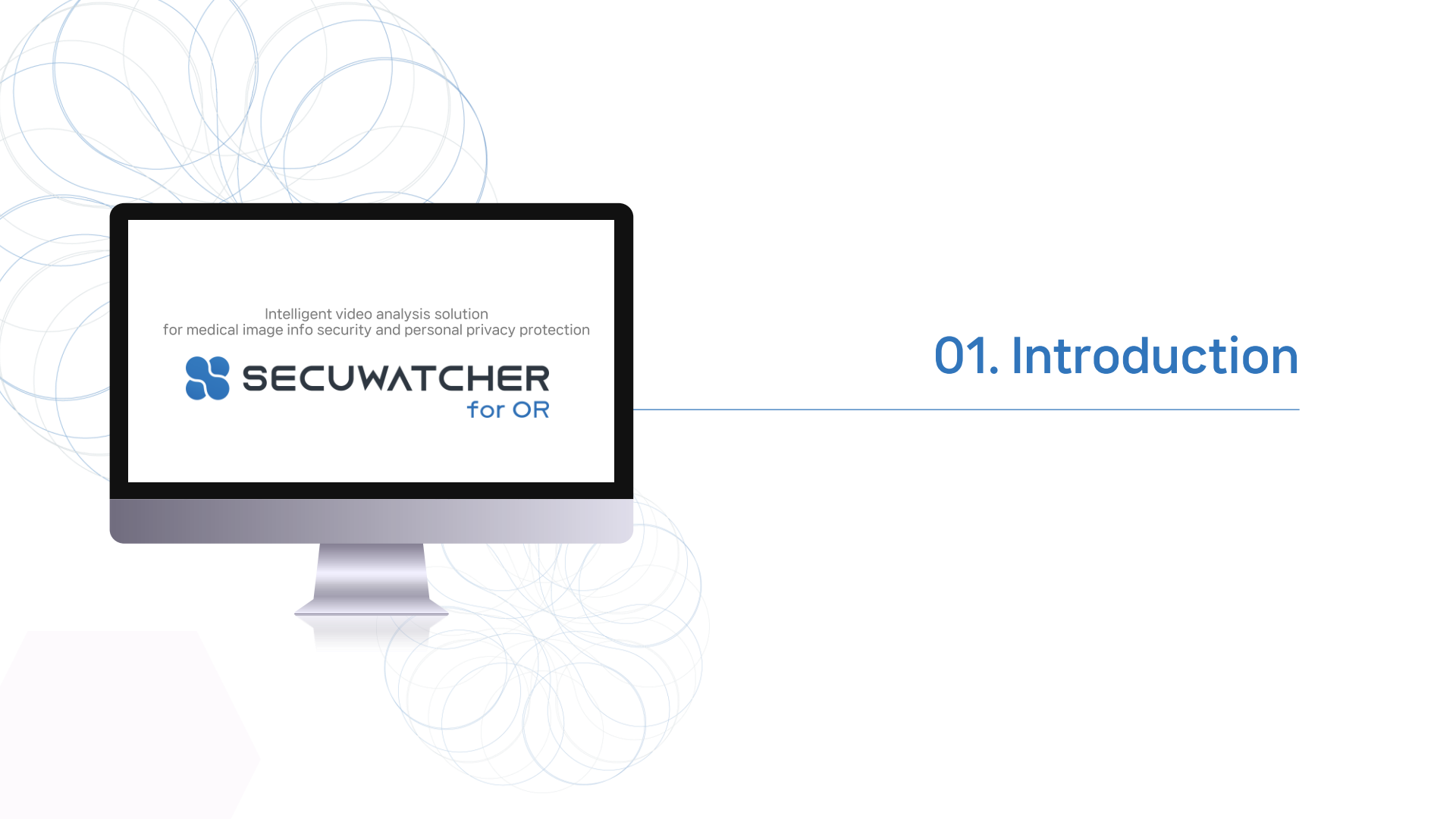
01. Introduction

02. Necessity

03. Overview

04. Major Functions

05. System Configuration & System Specification



Intelligent video analysis solution
for medical image info security and personal privacy protection

 **SECUWATCHER**
for OR

01. Introduction

Introduction

Medical Service Issues & Disputes

Status of Consulting for Medical Disputes		
Year	Total	Daily average
2016	46,735	189.2
2017	54,929	225.1
2018	65,176	266.0
2019	63,938	259.9
2020	56,574	227.2

Cases processed for medical evaluation by year							
Classification	Total	2016	2017	2018	2019	2020	
-	7,040 (100%)	859	1,202	1,969	1,737	1,573	
Medical Error	Surgery	2,705 (38.4%)	313	417	625	691	659
	Treatment	1,532 (21.8%)	163	239	409	372	349
	Diagnosis	842 (12.0%)	95	156	203	227	161

Source : Korea Medical Dispute Mediation and Arbitration Agency, Apr. 2021, 『2020 Medical Dispute Mediation & Arbitration Statistical Yearbook』

“Among incidents processed for medical evaluation due to medical disputes for the recent 5 years, medical disputes occurred in the order of **Surgery (38.4%), Treatment (21.8%), and Diagnosis (12.0%).**”

Necessity of CCTV in operating room




CCTV images of late-Kwon Dae-hee's surgery

In 2016, the late-Kwon Dae-hee died from excessive bleeding during facial bone contouring surgery at a cosmetic surgery clinic in Gangnam, Seoul.

The family of the deceased got to the heart of the matter regarding the death of their son by acquiring CCTV footage and medical records from the hospital.

The CCTV footage of the operating room played a crucial role in investigating the cause of death, and the necessity of CCTV footage of the operating room began to emerge due to this accident.



Intelligent video analysis solution
for medical image info security and personal privacy protection

 **SECUWATCHER**
for OR

02. Necessity

Necessity

Related Bill 1

» Passed bill for making CCTV installation in operating rooms mandatory
(Law No.18468, Sept. 24, 2021, Partially amended)

※ Main details of the amendment bill (alternative) for the Medical Service Act

1. Medical institutions performing surgery on unconscious patients shall install CCTVs in operating rooms.
2. When a request is made by a patient or a patient's guardian, the medical institution shall record a surgery through CCTVs.
3. The medical institution shall take measures in order to prevent loss, theft, leak, and falsification of the imagery data recorded through CCTVs and store them for more than 30 days.
4. The perusal of the imagery data shall be allowed only after receiving consent of the information subject, including the patient and the medical personnel.

Need for provisions regarding the full enforcement of making installation of CCTVs in the operating room mandatory (Sept. 25, 2023-).

Related Bill 2

» Personal Information Protection Act

※ Article 18-5 (Limitation to Out-of-Purpose Use and Provision of Personal Information)

A third party provided with personal information shall take necessary measures to ensure the safety of the personal information.

※ Article 21-1 (Destruction of Personal Information)

The personal information shall be destroyed without delay when the personal information becomes unnecessary.

※ Article 29 (Duty of Safeguards)

Technical, managerial, and physical measures necessary to ensure safety of the personal information shall be taken.

Need for compliance to Personal Information Protection Act

Survey

Need for 'image data encryption', 'image masking', and 'image forgery prevention technology' to protect personal image information as a result of a survey.

Issues & Necessity


Personal information leakage due to hacking or inadequate mgmt. of CCTV images.

Need for safe mgmt. of CCTV images and means of exporting images.

SECUWATCHER for OR

Manages Compliance to Personal Information Protection Act and Medical Accidents in Operating Rooms by using SECUWATCHER for OR performing safe management of export of CCTV images based on real-time personal privacy protection and prevention of image forgery.





Intelligent video analysis solution
for medical image info security and personal privacy protection

 **SECUWATCHER**
for OR

03. Overview

Overview

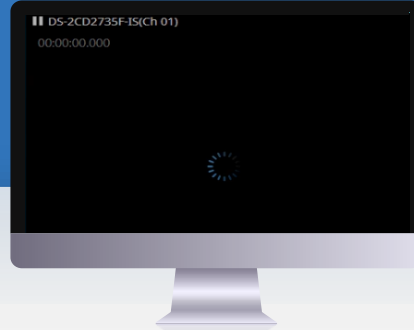
"CCTV image information security solution for operating rooms, which support the storage of image security and safe export of images to protect personal privacy (encryption)"



Complete protection of personal privacy based on Personal Information Protection Act



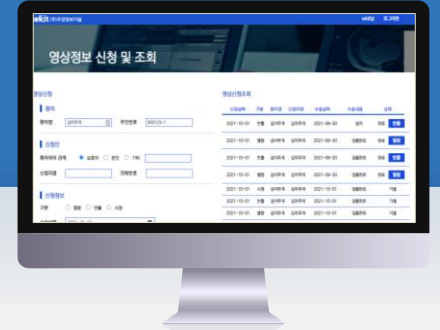
Fast encryption/decryption of high definition large capacity images


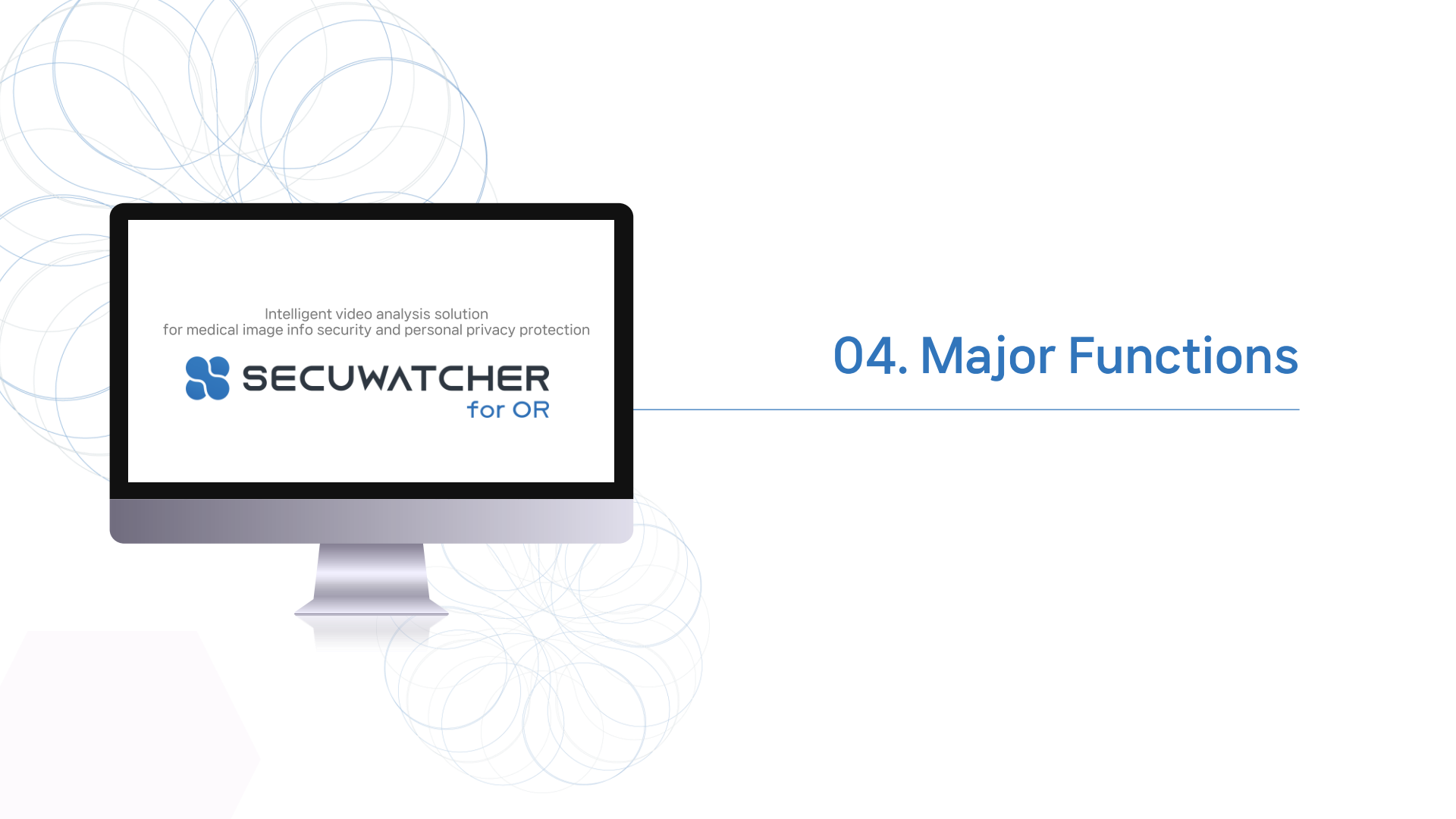


Prevention of image forgery and safe management of image exports



Provides only necessary information according to access rights for each account when exporting images





Intelligent video analysis solution
for medical image info security and personal privacy protection

 **SECUWATCHER**
for OR

04. Major Functions

Major Functions

01 - Object Detection & Masking Function

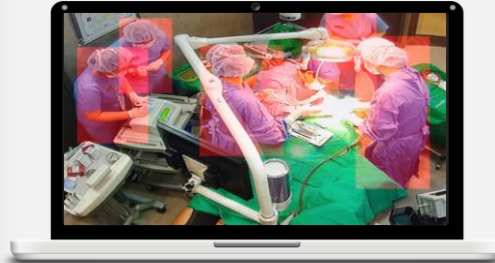
Detailed Functions

- ✓ Provides **selection between automatic object detection/manual object detection functions** to provide personal privacy
- ✓ Auto object detection : Provides **automatic detection & masking function** detected in CCTV images
- ✓ Manual object detection : Provides **automatic detection & masking** function regarding **selected objects in CCTV images**



Expected Effect

- ▶ Compliance to **Personal Information Protection Act by protecting the personal privacy** of physicians, medical staff, and patients in CCTV images



Automatic object detection



Manual object detection



Major Functions

02 – Quick Masking Function

Detailed Functions

- ✓ Quickly protects an individual's information by providing Quick Masking function for CCTV images.
- ✓ It can be used when watching a scene of a surgery in real-time and viewing saved CCTV images



Expected Effect

- ▶ Effective usage when an individual's information protection is urgently needed by providing Masking function for entire CCTV video image.



Original CCTV image



Real-time image applied with Quick Masking



Major Functions

03 – Image Forgery Prevention Function

Detailed Functions

- ✓ Inserts **watermark in the form of an image or text** to prevent forgery of images.
- ✓ Provides function **for setting where to insert the watermark** in an image.



Expected Effect

- ▶ **Ownership of an image can be claimed when an image is forged or misused** by using digital watermarking technology.
- ▶ Provides a function **for preventing forgery of user-customized images by providing a function for selecting** watermarks in the form of an image or text.



Watermark location setting & text input



Selection of watermark image



Insertion of text watermark

Major Functions

04 – Recording Control Function

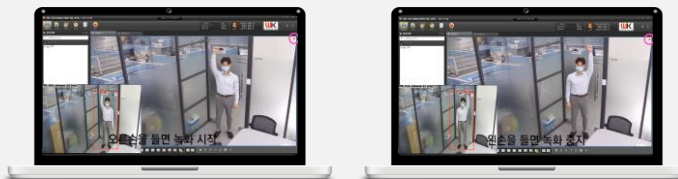
Detailed Functions

- ✓ Provides a function for **controlling selected recordings** to record surgery images.
- ✓ Motion recognition-based recording control
 - Raising right hand : Begins recording
 - Raising left hand : Stops recording
- ✓ Foot switch-based recording control
 - Foot switch on : Begins recording
 - Foot switch off : Stops recording

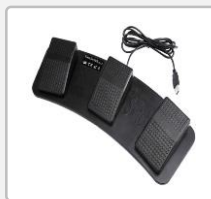


Expected Effect

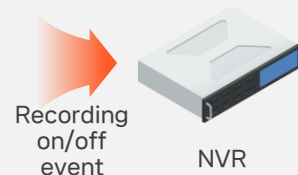
- ▶ Efficient video image recording and enhancement of user convenience by providing and managing recording control function suitable for an operating room.



Motion recognition-based recording control



Foot switch-based recording control



Major Functions

05 – Image Export Function

Detailed Functions

- ✓ Searches and views/exports operating room images according to the access right of each account recorded for the administrator.
- ✓ Manages export history through encryption and image export management server when exporting images.
- ✓ Provides a dedicated player for requested video images.



Expected Effect

- ▶ Capable of internal access control by providing only information according to the access right of each account with management of export history.
- ▶ Capable of video image access control by providing a dedicated player for the exported images.



Image export function

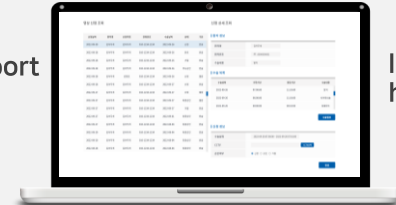

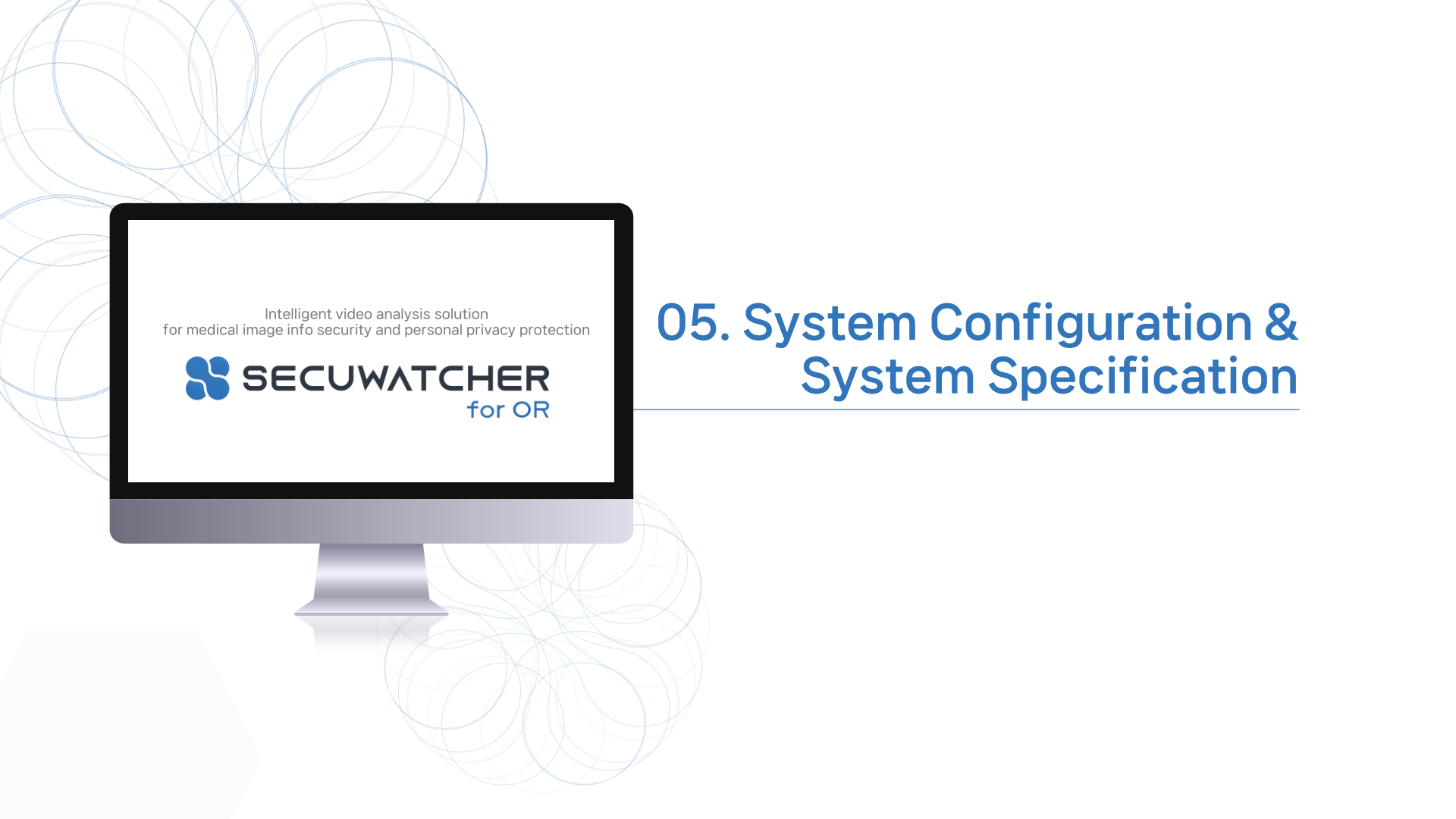


Image export history mgmt.



Viewing of requested images using a dedicated player



Intelligent video analysis solution
for medical image info security and personal privacy protection

 **SECUWATCHER**
for OR

05. System Configuration & System Specification

System Configuration & System Overview

System Specification

✓ Video image export system

- ▶ S/W
 - SW-OPR Management System / SW-Masking
- ▶ H/W
 - Intel® Xeon 6248R (24Core, 48Thread, 3.0GHz)
 - Win Server 2019 Standard (16Core, 5CAL) / MariaDB
 - DDR4 32G / 4TB HDD

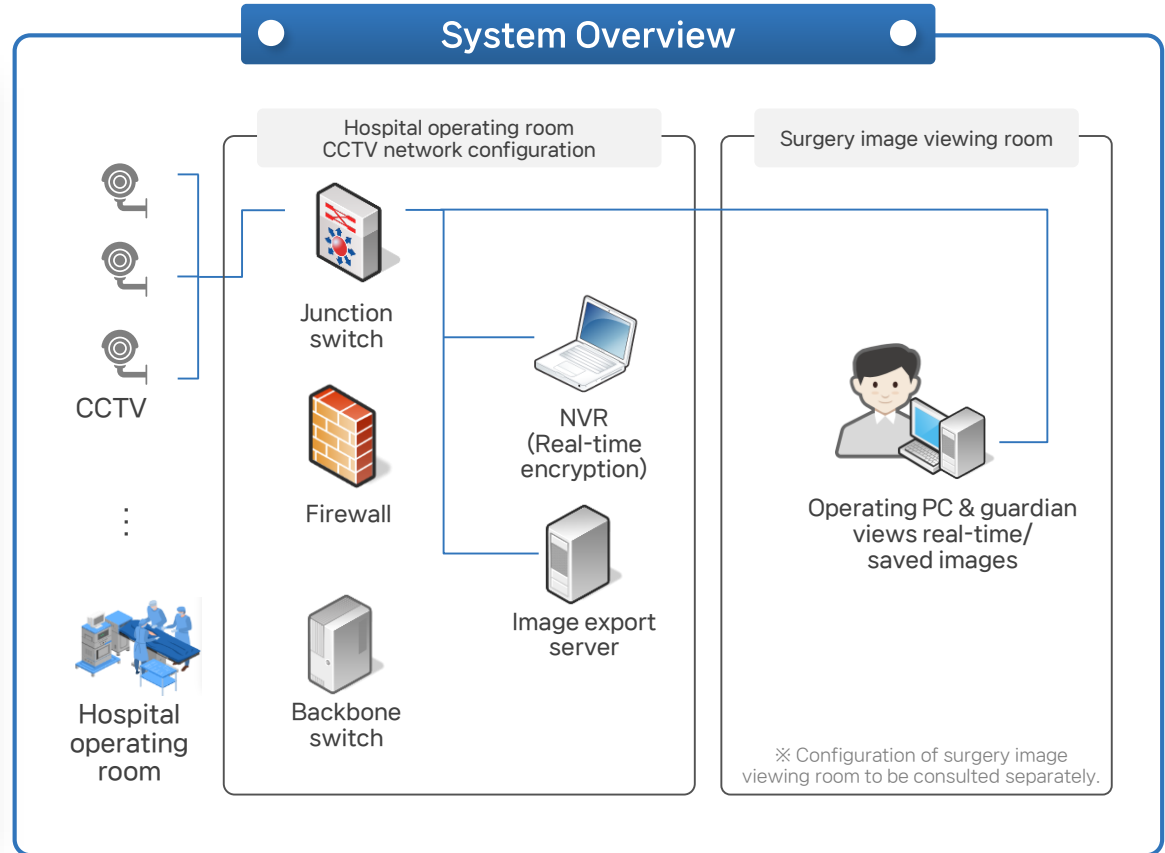
✓ Image encryption system

- ▶ S/W
 - SW-ENC Manager System

▶ Client

- i3-10100 / Live : 1080p(750fps) / Recording :1080p(480fps) / DDR4 16G / SSD250G
- i5-10100 / Live : 1080p(480fps) / Recording :1080p(480fps) / DDR4 32G, SSD250G
- i7-10100 / Live : 1080p(480fps) / Recording :1080p(480fps) / DDR4 32G, SSD250G

System Overview



Creating a Smarter Future with AI Technology



wkitglobal@wkit.co.kr | www.wkit.co.kr