

Video technology for the “operating room for the future”

Mission High Tech

Surveillance systems with automated recording and analysis functions in Europe’s first experimental operating room ensure more safety and control

Tübingen, Germany 2008/08/07 (profact) – It draws a lot of attention among surgeons these days: Europe’s first experimental operating room.

Since the official dedication by Baden-Württemberg’s minister president Günther Oettinger (Christian Democratic Union, CDU) some weeks ago, surgeons, medical technologists, architects, engineers and scientists have been continually coming and going. The room is 1000 square meter big and offers a unique and interdisciplinary prerequisite for co operations between numerous research facilities and industry partners, emphasizes general manager and initiator Ulrich Matern. “One of our main goals is to develop simple, intuitive and efficient dialogues between human-beings and machines”, the medical scientist explains and refers to the latest survey results among surgeons and nurses working at operating rooms. “70 percent of the surgeons and 50 percent of the nurses report of problems with the correct operation of the equipment – which can be disastrous for patients!”

Digital video cameras make sure you see the whole picture

In the experimental OR it is not medical procedures on human-beings that are carried out but the simulation of operations. This enables scientists to replicate and optimize procedures for operating rooms. “Ergonomics plays a significant role during in this process”, says Matern. Very often, force of habit is the reason for partial considerable time delay or operating errors on the equipment. In order to disclose redundancies and mistakes, the team of the experimental operating room employ

state-of-the-art surveillance technique. Core elements are the C-MOR video servers provided by za-internet, a young and dynamic enterprise located in Hechingen, Southern Germany. According to Michael Reuschling, general manager and founder, the main reason for choosing za-internet’s technique was the smooth installation and operating process. “Our servers are homogeneous components of a wireless



Illustration 1: C-MOR captures operations in the OR

and wired network, including internet access provided by us“, explains Reuschling. The complete video software is part of the server operating system, configuration and access to the video data is effected over conventional internet browsers which renders additional software installations unnecessary.

Automatic motion detection with alarm function

„The use of dedicated video servers offers decisive advantages”, explains Reuschling. “Many video surveillance systems consist of cameras that have only been connected through a network server. The data of only two or three cameras with a few pictures per second can be easily processed by a high-capacity server. But a network consisting of 15 cameras



Illustration 2: Later analysis of recorded videos

constantly recording at the same time will bring these servers down.” According to Reuschling, C-MOR video servers easily manage the information flood. And there is more: „Besides continuous video surveillance the experimental OP is also in need of input of motion-controlled recordings.” With this technique it is possible to selectively record areas of the video picture that are limited to only a couple of centimetres. “We are able to specifically record the hands of the surgeon or

anaesthesiologist only when they are moving.” In this manner it is easy to uncover wrong moves as well as operating errors with technical equipment. Another option is the recording of the table with medical instruments in order to rule out that tweezers or swabs are left in the patient’s abdomen. “By comparing the table situation before and after the operation, an automatic alarm could be set off in case something is missing”, Reuschling describes a possible scenario.

Beware of the camera!

Besides fixed installed video cameras on the walls, the experimental OR is also working with flexible cameras. The digital data is transferred over WLAN, which is not possible in “real” operating rooms due to the radio frequencies. “In the experimental OR cameras can be easily installed – for example at the mounting of an OR lamp”, explains Reuschling. “By the means of WLAN the team at the operating table is able to spontaneously start recordings by only logging into the video server.”

For Dr. Matern the making of these documentations on surgical work are an essential part of the experimental OR. “The costs for treatment of complications that have been caused by operating errors - for intensive care units in Germany alone – are projected at 396 million Euros per year.” Due to this fact one of the main objectives is to identify, quantify and qualify existing problems and their danger potential at work in operating rooms. „The video technique in use plays a significant role”, says Matern. „The incorruptible eye of the camera reveals even the slightest error.“

Web Links On The Topic:

Homepage of The Operating Room for the future: www.experimental-op.de/en/

Homepage of C-MOR video server with demos: www.c-mor.us

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