



SUCCESS STORY

Increased Productivity at UCLA

Improving patient care with Axis video solutions

The mission

- Monitoring quality of radiological studies took too much time.
- Radiology department needed a remote monitoring capability to adequately supervise radiological studies.

The solution

- Video servers capture video signals from scanners for display on a web page.
- Remote monitoring system enables radiologist to visually evaluate patient positioning during a study and to perform a quality check before the patient can leave the room.

The result

- Remote supervision of scanner studies saves each radiologist nearly an hour every day!
- Enables radiology department to use its expertise more efficiently
- Improves patient care by reducing the wait for a radiologist to check a study before the patient is released.



The customer

"With the economic drive to provide high quality supervision over a much larger distributed area the remote monitoring system based on the Axis video servers enables us to use our expertise more efficiently."

Dr. Osman Ratib,
Professor & Vice Chair of Information Systems,
Department of Radiology, UCLA.

Need for quality checks

Radiological procedures such as magnetic resonance imaging (MRI) and computed tomography (CT) typically take 30-90 minutes, and require medical supervision throughout the study. At the Department of Radiological Sciences, University of California, Los Angeles (UCLA) the staff must monitor scanning activity at any of the fifteen scanners scattered over four buildings in the main campus area, plus one remote building at an affiliated hospital.

Before releasing a patient from the examination room, the attending radiologist must perform a quality check to see if the captured images are adequate for making a diagnosis. Several times daily radiologists made the round trip between buildings to supervise scanner studies.

Today, Axis Communications' video servers enable radiologists to remotely view images from any scanner at any time throughout a procedure. Video signals from a scanner are converted into a digital image for display on a web page—eliminating the trek over to the scanner building.

Although some radiology procedures require direct radiologist-patient interaction, most require only supervision to assess quality of the study before a patient can be released. In 1991 the Radiology Department implemented a video network for remote viewing of radiological studies from reading rooms in other buildings. Unfortunately newer, high speed, high resolution scanners are not compatible with the older video network.

"With acquisition protocols for CT and MRI becoming more complicated, there was increased need for supervision," says Dr. Osman Ratib, Professor & Vice Chair of Information Systems, Department of Radiology, UCLA. "We needed to provide a tool to help ensure adequate supervision of every study."

Web-based network

Constrained by university budgets, the Department of Radiology decided that a web-based network offered the best solution for distributing live video images to multiple areas in the department. Their goal was to enable radiologists to remotely supervise CT and MRI studies over the university's intranet by using a standard web browser from any desktop computer to access the video application.

UCLA turned to Axis Communications for high quality, yet affordable video servers to capture video signals from the scanners and dynamically update them for display on a web page. The video servers directly capture analog video signals from the older scanners and generate a digital image. On newer, high resolution scanners, images are first converted into a standard video output that the video server then converts into a digital stream of images.

In operation the system delivers live images with a resolution of 320x240 pixels at a frame rate of 2 to 3 images per second on a regular 10 Mb/s LAN. Helping radiologists keep a close watch on scanner activity, the remote monitoring system enables them to visually evaluate patient positioning during a study and to perform a quality check before the patient can leave the room.

"Every study must be checked by a radiologist," says Dr. Ratib. "Without the remote system for supervising radiological studies, we could not deliver the quality of supervision needed to meet today's standards."

After user identification and password control through a home page on the campus intranet, a radiologist can go directly to a page containing a list of all the scanners in the department. Different streams of images are accessed through a convenient graphical interface.

Three screen selection buttons offer three major viewing options for each scanner. Selecting the first button yields a stream of live images to monitor ongoing procedures. When a technologist needs help in a particular area of a study, clicking on the second button gives the radiologist a closer look at a full resolution (640x480 pixels) static image of a selected area. For scanners with a monitoring camera, the third button allows observing the patient in the scanner.

The Axis video server is also a web server on the network, accessible directly through its IP address. A stream of live images is pushed by the video server directly to the web browser application in the radiologist's PC, where a pop-up window shows the live scanning image. When a high resolution image is requested, another web page is generated in a separate window, while keeping the list of scanners in the original window in the background.

Using expertise more efficiently

A survey of fourteen faculty radiologists concluded that the remote video images were quite suitable for supervising procedures, positioning imaging slices, and performing routine quality checks before completion of a study. In addition to general enthusiasm for the system, survey results showed that an average of 4 to 5 trips to the scanner room could be avoided every day. In short, using the Axis video server-based system for remote supervision of scanner studies could save each radiologist nearly an hour every day.

Dr. Ratib notes that the number of cases has increased tremendously. Since the department has a limited number of expert radiologists to cover a wide area, it is difficult for a radiologist to be in direct attendance at every study. "With the economic drive to provide high quality supervision over a much larger distributed area," says Dr. Ratib, "the remote monitoring system based on the Axis video servers enables us to use our expertise more efficiently."

Not only does the remote monitoring system increase radiologists' productivity, it also improves patient care by reducing the wait for a radiologist to check a study before the patient is released. With additional secure encryption techniques, a radiologist could also use the same system to monitor studies from outside the institution—even from home.

According to Dr. Ratib, the CT and MRI scanner monitoring system has been so successful, his department is already testing another system that will save doctors many steps daily by enabling remote monitoring of ultrasound tests. And yet another planned application promises to bring the remote monitoring concept to cardiac imaging procedures such as echocardiography (ultrasound imaging of the heart).

Today people everywhere are seeking faster and more convenient access to information in order to run operations more efficiently, improve profitability and serve customers better. The field of medicine is no exception, and radiologists at UCLA are acutely aware of how remote access to critical data can make their work more effective.

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