



“The arrival of the Mac systems with the intuitive Mac OS X operating system and the powerful OsiriX GUI opened the floodgates of 3D image analysis and revolutionized workflow in the clinical departments.”

Dr. Osman Ratib

Geneva University Hospital. Filling the Image Analysis Needs of 15 Clinical Departments.

The physicians and surgeons at Geneva University Hospital had a frustrating problem. The Radiology Department had installed new imaging devices such as high-definition, multi-detector scanners and hybrid devices that combine PET and CT technology. These advanced modalities were producing images that were rich in detail and could help them immensely in planning treatment. The physicians' difficulty was in finding an effective way to view and analyze these images.

In the first place, if they wanted sophisticated image analysis they usually had to go to the Radiology Department and use the workstations that came with the imaging systems, because those workstations were too expensive to install in other departments. Secondly, the workstation software was not physician-friendly. And finally, the software didn't really provide the kinds of tools the physicians needed to analyze DICOM imaging data coming from different modalities, to come up with an effective, efficient diagnosis.

What hospital clinicians needed and wanted was a sophisticated analysis system that they could use in their own offices and conference rooms. They needed to review images for tumor board meetings. They needed image analysis within easy reach to plan neurosurgery, or joint replacement, or cardiac surgery, or any of the immense variety of procedures and treatments they wanted to apply.

“Hospitals everywhere face the same problem,” says Dr. Osman Ratib, who chairs the Department of Radiology and Imaging at Geneva University Hospital. “How do we get complex multimodality images out to clinicians?”

The answer: Apple technology and a powerful, Mac-based open-source DICOM viewer known as OsiriX.

OsiriX was conceived by Ratib, and written by his colleague radiologist Dr. Antoine Rosset, when they worked together at UCLA in 2004 and saw the need for a more robust viewer and analysis tool. It was developed into its present form by Rosset and Geneva computer scientist Joris Heuberger. When Ratib and Rosset returned to Geneva University Hospital from UCLA in 2005, they were Mac enthusiasts on a mission.

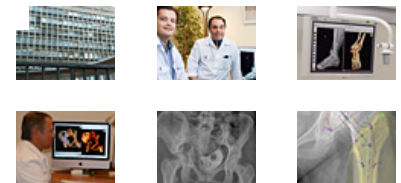
“The hospital's 2D web viewer was inadequate,” says Ratib. “Clinicians needed to see images from different scanners – all on one workstation. They needed to browse between multiple prior studies. They wanted to perform measurements of tumor size, organ function, and other clinical parameters. They needed a sophisticated navigation tool that lets them fuse different modalities in 3D. OsiriX, running on the Mac platform, could give them what they needed.”

Running the Security Gauntlet

The first thing facing the Department of Radiology was convincing the Hospital's IT department that OsiriX running on Mac Pro, iMac, and MacBook Pro systems would work well within the existing IT infrastructure without compromising data security or patient confidentiality. In 2005, they installed 10 Mac workstations throughout the Radiology department, including one in each radiology room.

To comply with the hospital's secure-environment regulations, the team integrated a security badge reader into each system. They also integrated COMPACS, a web-based intranet portal that enables users to select images from the hospital's picture archiving and communication system (PACS). The images appear in the

Photo Gallery



Video Gallery



OsiriX 3D before surgery
Dr. Peter uses OsiriX on his desktop iMac to create a 3D rendering of a presurgery CT scan of the patient, then exports the rendering as a QuickTime movie that shows a 360-degree view of the surgical target. He uses such 3D visualization tools to plan surgeries.



Mobile Analysis on the iPhone

The iPhone adds huge



potential to the reach and utility of OsiriX in the hospital. “Today we can send images over wi-fi,” says

OsiriX database on the workstation, and can be anonymized by the removal of patient demographics.

The test installation in the Radiology department was a clear success. "We installed Macintosh systems next to the PACS workstations, and started using them for diagnostic interpretation," says Ratib. "They quickly realized that OsiriX was about ten times faster than the other PACS workstations."

Ratib applied for approval for the deployment of 60 Mac workstations across 15 clinical departments. The hospital gave the go-ahead, and the team carried out the installations during 2007 and 2008.

Ratib. "Physicians can download anonymized cases on their iPhones for review at home or in a conference room."

Viewing radiological images on the iPhone enables physicians and surgeons to participate in decisions about patient care from any location within the wi-fi network. This capability speeds up the surgical planning process, particularly in cases where decisions must be made in short time frames for the sake of the patient's welfare. It also enables physicians to review downloaded images when their schedules permit.

"The iPhone is a real computer," says Rosset. "We have a complete Cocoa framework for it. We're looking forward to leveraging its potential to change the way we work."

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