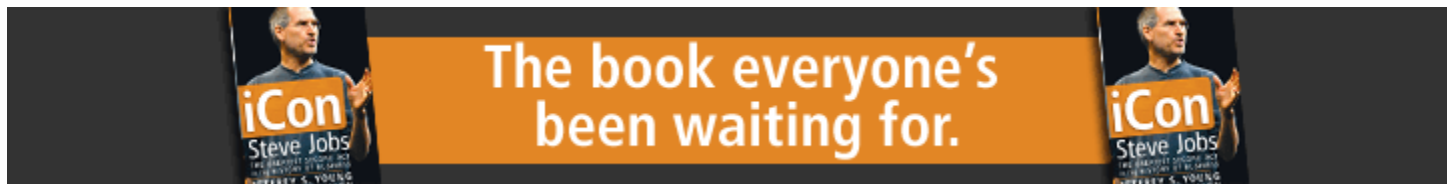


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## Technology XML

Posted on Mon, May. 16, 2005

### 3-D images help police

By Therese Poletti  
Mercury News

A police forensics laboratory in Rome is using a powerful supercomputer developed by Silicon Graphics to create a three-dimensional replica of a crime scene, to help solve murder cases.

The Italian police, which have been working with SGI since 1996, recently upgraded their system to SGI's six-processor SGI Onyx 350 Infinite Reality computer. Along with the more powerful computer, they also bought an immersive reality, 18-foot-by-7-foot screen, to display virtual three-dimensional images of a crime scene that has been mapped out by the supercomputer.

The system is being used in Rome by a laboratory called the RiTriDEC (Ricostruzione Tridimensionale dell'Evento Criminale), operated by the Italian state police for criminal analysis.

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Data gathered from the scene of a crime is fed into the SGI system. As soon as possible after a homicide, a technician will enter the crime scene, where he or she uses laser scanner beams to scan the entire location.

The pulse of the laser calculates how long it takes for the laser to be reflected back, and gets the distance from each end of the room, or the distance one object is from another in the room. These measurements also calculate the placement of the body and the trajectory of a bullet, or possible other murder weapons.

All the data that was scanned with the laser is then fed into the SGI supercomputer.

The Italian police have been using this method, without the addition of the immersive reality screen, to assist in the solving of crimes. The police were able to solve a 1982 Mafia killing of the chief of police in Palermo, Sicily, using an older SGI supercomputer to re-create the crime scene.

In 1982, Carabinieri General Carlo Alberto Dalla Chiesa and his wife and another officer were killed in a moving car in Palermo.

“The computer graphics helped us because we could reconstruct the crime scene, particularly a car moving down the street,” said Francesco Marelli, the technical director for the Italian state police, forensic science office. “We could introduce the velocity of the car and the computer could do the calculations and it could show something.”

Marelli said police were able to determine which witnesses were reliable through the various crime-scene reconstructions that showed what was actually physically possible.

The system can also capture the smallest details in a crime scene, which is essential to investigators. Carlo Bui, who supervises the project for the Italian police, said that in studying the scene of a crime, an investigator must behave like an art critic, and grasp even the smallest details within the scene.

Marelli said that with the new system and the three-dimensional environment, the police hope to bring witnesses to the laboratory, and possibly eventually bring a system like this in court. He also hopes that by having a witness in front of a true-to-life reconstruction of the scene, the police will illicit more information from witnesses, or possibly from the criminal.

“It’s very realistic,” Marelli said. “We are approaching a psychological study, where we can try to find what the feelings are of the people placed in front of the screen, how do they move, what do they say; all these things can help us build a better crime scene. . . . It might trigger some memory in the witnesses.”

The Onyx system starts at \$33,000. SGI has recently introduced a lower-priced system, the Prism, based on Intel’s Itanium family, that costs \$8,500. Using the new Prism, the whole system in place will cost about \$50,000, including the three-dimensional virtual-reality screen, and service charges to install the whole system. SGI said the laser-scanning service would be an additional charge.

The Italian police will eventually upgrade from their Onyx system, which uses SGI's proprietary MIPS chips, to the lower-cost Prism.

“We think this has the potential to take off and become more widely used,” said Greg Estes, vice president of marketing at SGI. He said he plans to begin marketing the Prism system to other police departments, the FBI and other investigators.

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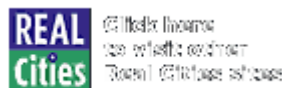
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