CRIME AND COMPUTERS

‘Digitally Enhanced’ Evidence Draws Challenges From Defense
BY MARK HANSEN

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On mother’s day 1995, 27-year-old Bible school student Dawn Fehring was found dead on the bedroom floor of her Seattle-area condominium. It did not take complex evidence analysis to determine she had been murdered.

Her body was found nude, lying near the foot of her bed, with her top bed sheet and a T-shirt wrapped around her head and neck. Bloodstains were found on the carpet near her body and on the fitted sheet covering the mattress. An autopsy showed she had been raped and strangled.

Police processed the crime scene for evidence and began interviewing neighbors, including a 32-year-old mill worker named Eric Hayden, who was about to become their chief suspect. Hayden, who lived upstairs and across the hall from the victim, seemed nervous during the interview and couldn’t account for his whereabouts on the night of the murder, police said. He told them he had been out drinking with friends, but couldn’t provide any names. He told his live-in girlfriend, who had been away for the weekend, that he was too drunk to remember where he had been.

But the crime scene yielded few clues as to the perpetrator’s identity; only a handful of bloody handprints in the victim’s blood on the pink fitted bed sheet. And those prints were so obscured by the color and the weave of the fabric, they couldn’t be identified through conventional means—even after a chemical process that turns bloodstains a dark blue.

That’s where Erik C. Berg, a pioneer in the field of digital imaging technology, comes in. Berg, a crime scene analyst and fingerprint identification expert with the Tacoma (Wash.) Police Department, had been experimenting with the use of a software program he helped develop. The software could “enhance” digital images or photographs processed through a computer, by filtering out background patterns and colors.

Berg had been waiting for a real homicide case on which to test the technology. So he took digital photographs of the bloody prints, downloaded them into a computer and filtered out the background pattern created by the weave of the fabric to make the prints stand out more clearly.

The immediate result: Two prints were positively matched with Hayden’s prints, on file from an earlier DUI arrest. Hayden is now serving a 27-year prison sentence for murder.

The long-term result, and one with potentially more far-reaching impact: the first of only two published appellate court decisions to date affirming the admissibility of digitally enhanced fingerprint evidence. State v. Hayden, 950 P.2d 1028. (Wash. Ct. App. 1998). The second was an Ohio Supreme Court case that was decided last October. State v. Hartman, 754 N.E. 2d 1150.

VARYING SHADES OF CONCERN

For police and prosecutors, the use of digitally enhanced evidence is a non-issue. They say the enhancement process adds nothing to the underlying image; it only makes what is already there more usable by improving sharpness and image contrast. They argue a fingerprint is too complex to be altered digitally. And besides, they say, the software they use to enhance the image would prevent them from altering it even if law officers wanted to.

But for some defense attorneys and experts on scientific evidence, the use of digital imaging technology raises serious questions about where enhancement ends and manipulation of evidence to fit police needs begins.

John Zwerling, an Alexandria, Va., lawyer who sits on the National Association of Criminal Defense Lawyers' board of directors, says he doesn't understand how an image can be enhanced without being changed.

"If you're going to enhance a photo, it seems to me you'd have to make some assumptions and fill in some details that aren't there," he says. "Otherwise, you'd be able to see it" prior to being enhanced.

And John Wesley Hall Jr., a Little Rock, Ark., lawyer who also serves on the NACDL's board of directors, likened digitally enhanced evidence to breast augmentation surgery.

"By enhancing what's there, you've also altered it in some way," he says. Some legal experts say defense lawyers have good cause for skepticism. James Starrs, a professor of law and forensic science at George Washington University, says the enhancement process is highly subjective.

"How are we supposed to know that what we're looking at is really an accurate depiction of what was found at the crime scene," he asks, "and not something that came out of the mind of the enhancer?"

NOT QUITE THERE YET

Carol Henderson, a law professor at Nova Southeastern University in Fort Lauderdale, Fla., says digitally enhanced evidence may one day prove to be a great investigative tool—but that day isn't here yet.

Henderson says digital imaging technology has never been shown to meet the legal standard for scientific evidence set forth by the U.S. Supreme Court in Daubert v. Merrell Dow Pharmaceuticals Inc., 113 S. Ct. 2786 (1993), and its progeny. In Daubert, the court held that scientific evidence is admissible only if it meets certain criteria, such as being testable, having a known or projected error rate, having been subjected to peer review and publication, and having achieved a level of general acceptance in the relevant scientific community.

Henderson says there are also no uniform standards governing the use of such technology, only a preliminary set of general guidelines put out in 1999 by an FBI-sponsored Scientific Working Group on Imaging Technologies. Those guidelines spell out recommended policies and procedures for the capture, storage, processing, analysis, transmission and preservation of digital images.

Another set of guidelines for capturing latent impressions using a digital camera was posted on the scientific working group's Web site in December. Those guidelines cover the kind of equipment and the types of procedures that should be used when taking digital photographs to be used as evidence.

Even Berg, one of the chief proponents of digital imaging technology, has pointed out in published articles some of the hurdles that need to be overcome when presenting such evidence in court, such as **documenting** the chain of custody and refuting allegations of tampering, Henderson says.

“Digital image enhancement will need to meet certain criteria before it is ‘picture perfect,’ ” she says.

But police and prosecutors say there is nothing new or novel about enhanced digital imaging, which was developed in connection with the U.S. space program and has long been used in other fields, from medicine to meteorology. And even if it were considered new or novel, they say, it satisfies the admissibility standard for scientific evidence.

King County, Wash., senior prosecuting attorney Tod Bergstrom, who represented the state in Hayden’s appeal, compares the process to fine tuning a radio or adjusting the picture on a television screen.

“All you’re doing is muting the background,” he says. “You’re not changing the original image in any way.”

COURTS EMBRACE PROCESS

So far, the only two appellate courts to have addressed the issue have agreed. And so have many trial courts, evidence experts say.

Edward M. Imwinkelried, a law professor at the University of California at Davis, says the courts have generally been receptive to the use of digitally enhanced photographs as long as the proponent of the evidence has made a proper showing of the reliability of the technology. In some cases, he says, judges have even ordered that photographs be enhanced to improve the quality of an image prior to trial.

Numerous other opinions note the use of digitally enhanced images in circumstances in which the issue of authenticity appears to have been either assumed or, at a minimum, not even raised on appeal, says Gregory P. Joseph, past chair of the ABA’s Litigation Section. Joseph, the author of Modern Visual Evidence, says that, as in so many evidentiary areas, the limited number of reported opinions may not reflect the level of use of such evidence at trial.

Fingerprints aren’t the only kind of evidence subject to being digitally analyzed. Bank surveillance videotapes have been enhanced to identify distinguishing features on a robber’s face. Background noise has been removed from wiretapped conversations in crowded bars. And typewritten documents have been examined digitally to detect forgeries.

The more police find ways to use digital enhancement, experts say, the more defense lawyers will find ways to contest its admissibility. And now that the technology is in relatively widespread use, there will likely be many more battles to come.