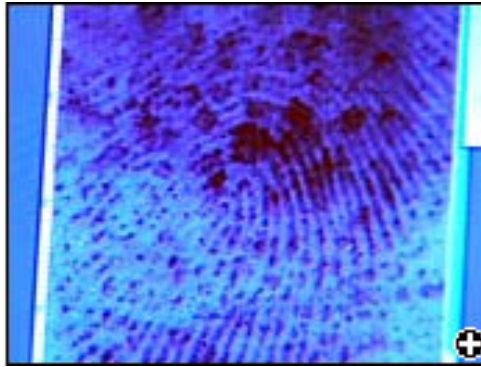


60 Minutes II - November 20, 2002 The Hidden Clue

(CBS) Detectives now have a new tool for cracking even the toughest of cases, Jim Stewart reports.



This new tool is helping police solve crimes. (CBS)



Erik Berg is a forensic expert with the Tacoma police. (CBS)



Dawn Fehring (CBS)

Known as digital fingerprint enhancement, it's become the silver bullet among police forensic units all across the country, but it was born out of frustration.

The story begins on May 14, 1995, in Kirkland, Wash., when police came across a young woman found murdered in her own home. The victim, Dawn Fehring, a 27-year-old bible student and missionary, was found in her bedroom, raped and strangled to death in an apartment virtually sterile of clues.

"It was spotless. I mean, you could still see in the carpet the lines from the vacuum cleaner; there was not a water glass on the counter top," says James Konat, the prosecutor in charge of the investigation.

Police surmised that Fehring had been baking for Mother's Day and most likely had left her front door open for ventilation. That explained why there was no sign of forced entry, and they had no witness, no motive, and no hot leads. There was no DNA. The only real clue they found that day didn't look promising. It was the victim's bed sheet, with some bloody smudges on it, like someone had wiped his hands.

"Prior to this time, we were not aware of situation where a fingerprint, or in this case a palm print, had ever been lifted off a fabric, like a bed sheet, particularly a print that had been left in blood," says Konat.

As every prosecutor knows, you can't dust a bed sheet for prints. All the distinguishing arches, whorls and loops of a print get lost in the fabric. Technicians tried to find detail on the sheet. They treated it with chemicals, rinsed it, and dried it, hoping for the best. They got detail, but the process also highlighted the weave of the sheet, virtually obscuring the mountain-like ridges of the prints. They called Erik Berg, a forensic expert with the Tacoma police, for help.

Although he worked in the forensic unit, Berg's real passion was computers. Heavily investing his own time and money, Berg had spent years in the back room of his house developing software that could enhance crime scene photos. He'd been itching to try it on a real murder.

Berg selected what are known as pattern removal filters from his own computer program, which he called More Hits, as well as from Adobe Photoshop, the same software used by artists and many home computer users to fix up photographs and create special effects.

He used his computer to remove the extraneous patterns, and so make the fingerprint more apparent – enough for an expert to make a match.

Once Berg was through, he printed out his work, and handed it back to the examiners, who then checked for anyone considered even a potential suspect who had ever been arrested and had his prints taken. They found one. It was a palm print from Eric Hayden, a 32-year-old mill worker who lived a flight up from Fehring. They used their magnifying glasses and compared Hayden's print from the files with the enhanced print.

Two hours later, police had made an arrest.

But Berg's work would mean nothing at trial if he couldn't prove it didn't alter the evidence. So, he created what he calls an authentication system to protect the photo's pixels and track every mouse click and keystroke he executed, so that any expert could repeat the process.

Once jurors watched Berg demonstrate his work, they believed in it. Hayden was convicted and ultimately sentenced to 26 years for the rape and murder of Fehring.

"I really believe that when he left there, he thought he'd gotten away with it," says Berg.

It didn't take long for cops all around the country to grasp the significance. With this system, cases that were once deemed unsolvable suddenly became hot again. Interest skyrocketed and forensics labs began shelling out more than \$40,000 for their own package, including Florida's Broward County Sheriff's office, where Dave Knoerlein has worked with the technology for two years now.

"We're looking at other cases and looking, re-looking at the evidence in those cases to see if that would benefit from digital enhancement," he says.

One case involved Victor Reyes, a convicted drug dealer. He was charged with murder in connection with the 1996 execution-style shooting of a man whose body was found dumped by the side of the road, wrapped in a blanket and bound with duct tape. Last year, five years after the killing, Berg's software played a role in identifying smudged prints on the duct tape, originally deemed of no value. The software revealed Reyes prints.

Not everyone likes the new program. "I think this is a prime example of junk science," says Barbara Heyer, Reyes lawyer. She's mounting an aggressive attack against digital fingerprint enhancement.

"It's very suspicious that you have something that is of no value and you suddenly enhance it and becomes of value," she says. "I mean it's very clear that this type of thing can be manipulated."

Not only did Knoerlein remove the background pattern of the duct tape, as Berg did with the bed sheet, his fiddling went a step further. He boosted the image using a technique called dodge and burn, which uses a computer brush to create highlights and shadows in a picture as photographers do in the darkroom.

Is it an art form, or a science?

"I would say if you're being creative and doing photo as an art form, then, yeah, sure, it could be an art form. As a forensic analyst doing digital image enhancement, I believe it's more of a science, because I'm not-trying to create something. I'm trying to make something that's already there more visible," says Knoerlein.

The distinction is crucial because unlike removing background, like a fabric pattern - a process that can be tracked and copied - dodging and burning is a different matter altogether. It is as arbitrary as making a brush stroke on a canvass. It can never be done the exact same way again by another forensic expert. And that raises the specter of evidence tampering.

You can't duplicate the original print exactly, Knoerlein says, but you can get close, and that is good enough.

Heyer disagrees: "When you're talking about someone's liberty, taking someone's liberty away, I don't believe that the courtroom is the place to try out this junk science."

Berg's work on the Fehring murder was found to be valid and went on to become part of a landmark case in the state of Washington. Since then, other states have followed, ruling that although new, it is, indeed, a science fit for the courtroom. That includes Florida, where the judge will allow it into the upcoming trial of Reyes. Berg will most likely be called to the stand to defend his invention.

Could the new tool be manipulated to manufacture evidence?

"I think anything man can invent, man can manipulate," says Berg. "So I'm not going to say, 'No. It couldn't be.' But you still have an authentication process, so if you're going to do this, it's going to be a purposeful kind of a manipulation. There's not going to be, 'Oh, well, I didn't know I did that.' You know you did it."

In the end, it all comes down to trust.

Says Berg: "I'm not putting your clients' fingerprint on the evidence and saying, 'Look what I found.' Your client put that fingerprint there. I simply found it. Now, did I find it with a magnifying glass? Did I find it with a brush and powder? No. I found it with a computer."

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