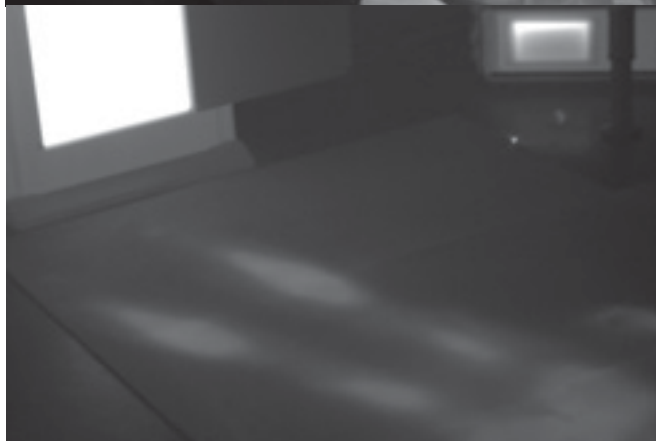


# Infrared photography aids forensic research

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**A crime is committed. Detectives spring into action. Some prints remain while others have gone for good ... or have they? The Netherlands Forensic Institute (NFI) asked TNO to investigate using an infrared camera at the scene of the crime. Such a camera makes information that is invisible to the human eye visible.**

A trace of blood is not always fresh. The light used by an intruder is long extinguished. What a shame because crime reconstruction is aided by every little bit of evidence to complete the picture. 'Conventional photos and videos are used in crime scene investigations,' explains Dr Miranda van Iersel of TNO. 'They register that part of the spectrum that is visible to the human eye, so a detective may miss vital evidence. We believe that using an infrared camera may be of some added value. It can register the difference in temperature between an object and its environment. And it can even see the blood trace and the diminishing light of the table lamp! But to find out if our presumptions were correct, we undertook a series of tests.'

## KEY RING

'To start with we simulated situations confronted at crime scenes,' Van Iersel says. 'Like a victim on the floor, recently extinguished lamps and a monitor, mugs containing hot and cold drinks, and a puddle of water on the floor. The infrared photos show that the victim had a key ring in his trouser pocket, a detail that is not apparent on a normal photo. That's not all. If a victim is dragged off, his body heat print remains for a while on the floor. Only after an hour or so does the print fully disappear. The light of the lamps disappears within fifteen minutes and the monitor still glows for an hour and a half after being switched off. The hot and cold drinks remain visible for four hours.'

Because the puddle of water can be identified on the infrared photo for a longer time, Van Iersel looked at various other substances in a second experiment. She found that, at room temperature and humidity, garden soil is visible for four hours, cleaning liquid for 11.5 hours and drops of water for up to 22 hours.

## VISIBLE FOR A DAY OR SO

The third experiment concerns biological traces like blood, sperm and urine on different backgrounds. Each of these is illuminated on infrared photos for a shorter or longer period. 'That can be really interesting for the NFI and the police,' Van Iersel believes. 'Because at a crime scene it is exactly this type of evidence that is frequently found. On some backgrounds, especially on an MDF board and metal, the traces are visible for a good day or so.'

As supposed, the use of infrared images leads to new information. Van Iersel: 'Of course, we want to be able to reproduce all those different shots as well as possible so we came up with the idea of coupling the infrared images to a 3D model. The result is a reconstruction in which the detective can look around the crime scene and gain insight into his assumptions. Through this and other such ideas we hope we are doing our bit to help in solving crimes.'

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Photo top: The 'victim'. To the naked eye, no interesting clues in evidence.  
Photo centre: Thermal image of the same person. Temperature differences of, for example, objects in the trouser pocket become visible without the need to disturb the 'victim'.

Photo bottom: The 'victim' heated the floor before being dragged away. Such temperature differences of a recently removed body remain visible for nearly an hour, depending on the type of surface, ambient temperature, etc.