

Possible Mistakes in Forensic Photography

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ABSTRACT: As Confucius said, a picture is worth a thousand words. Moreover, when we talk about forensic photography, we must choose our "words" carefully, as they must lead to the satisfaction of the purpose of the criminal trial, namely the finding of the truth or, more precisely, the timely and complete ascertainment of the facts which constitute crimes, so that no innocent person is held criminally liable, and any person who has committed a crime is punished according to law. Forensic photography, unlike the other branches of photography, has the ability to become a decision-maker in sentencing or acquitting a defendant, just as it can make the difference between life and death in states where the capital sentence still applies. For these reasons, I have proposed that, in this paper, I expose mistakes that may occur in the execution of forensic photographs, the causes of these mistakes and the solutions for their prevention and removal.

KEYWORDS: mistakes, forensic, photography, crime, investigation

Introduction

Forensic photography is the first set of procedures for forensics. After the emergence of daguerreotype, professional photographers were hired in order to take portrait photos of criminals. This early application later led to the emergence of the standard procedure known today internationally as mug shot. Although there were no technical rules to follow, the photographs taken of criminals were different from those usually taken, as they were not used for artistic purposes, but were intended to provide an evidence of those who committed crimes.

Today, however, forensic photography is defined as "a system of special technical methods and procedures of photography with application in the activity of prevention and detection of crimes, in performing criminal prosecution, investigation, operative supervision, expertise and technical-scientific finding." (Iurie 2015, 1).

Objectivity and visual fidelity are the main features of this branch of forensics (Stancu 2015, 86). For example, in the case of on-site photography, it is considered that, as long as the rules and technical recommendations are observed, the photographs will honestly and completely capture the crime scene, as well as the elements that compose it - weapon, corpse, traces, and utensils. Therefore, in order to place the result of these activities in the vicinity of the truth, it is imperative to follow certain rules and recommendations.

Preliminary mistakes

The most common mistakes in carrying out any activity take place just before this moment. These include inadequate technical equipment and lack of technical training. With regard to the equipment available to persons designated to perform such tasks, they must be sufficient to cover any shooting hypotheses, regardless of the procedure, time, place, environment, weather conditions, workload, any obstacles, and lighting conditions. In this sense, if daytime shooting does not present a high degree of difficulty, low light conditions create difficulties in the absence of professional equipment. Without addressing this in detail, it is recommended that a complete photography kit contains at least a high-performance camera, wide aperture lenses that cover a wide range of focal lengths (from ultra-wide to super-tele), a tripod, filters, sources of artificial light, diffusion and reflection elements, batteries and memory cards, cleaning kit. It is also important to equip the photography kit with a backup camera, as there are many situations in which the shutter system stops working due to the large number of photos taken.

Photographers need to know in detail the functions, buttons and settings of the devices they use, as the time available is not always enough to search through the camera menu or to consult the instruction manual or the user guide. It is also recommended to shoot in RAW format, with the help of which much more details can be obtained during the post-processing of images in a photo editing software.

Insufficient documentation

A general mistake is an insufficient photographic documentation, which consists in taking a small number of photographs related to the case, in omitting to capture all the elements relevant to the case or not performing all the photography procedures required in those circumstances.

There must be some proportionality between the complexity of the case, the elements, the existing objects in the criminal field and the number of photographs. If excessive photography is not an impediment to fulfilling the purpose of the criminal trial, insufficient photography is a mistake that can lead to not finding out the truth. It is recommended to perform all shooting procedures, the rule being shooting from general to particular. As such, when photographing a corpse in an apartment, it must be photographed as well as the vicinity of the block where the apartment is located, the staircase of the block, the landing, the apartment, the weapon with which the murder was committed, traces and other elements that have the ability to be relevant in solving the case.

Wrong photo exposure

Outside the realm of forensic activities, exposing a technically incorrect photograph can lead to pleasing visual effects on the human eye. Underexposing a photo can lead to complete darkening of shadow areas and “low-key photos” or even “silhouette photos”, images that can attract the viewer's attention. Likewise, overexposing a photo can lead to so-called “high-key photos”, where illuminated areas turn into white areas. But the judicial photos are placed in the opposite corner to the artistic photos. These must first be executed technically correctly as criminal investigation activities impose rules of an imperative nature, and the delivery of a conviction must be based on clear evidence. Improper exposure of a photo is one of the most common mistakes when taking a photo and is mainly caused by two situations: using the camera in manual mode and setting the parameters (aperture, shutter speed, ISO value) incorrectly; using the camera in automatic or semi-automatic mode (aperture priority, shutter speed priority), the cause of the error may be incorrect selection of the camera's measurement mode or lack of camera accuracy in measuring available light and calculating required light).

First, it should be noted that it is recommended to use the manual mode of the camera whenever the situation allows, in order to have total control over the image. In situations where there are quick and considerable changes in the amount of light, and the time available does not allow adjusting the settings, it is recommended to use semi-automatic modes, so that these radical changes do not completely compromise the photos. At the same time, it is imperative to take pictures every time in RAW format, uncompressed. This image format allows the storage of a much larger amount of information, so that, with the help of post-processing, blown highlights or clipped shadows can be recovered, which is not possible using the JPEG format.

The aperture value must be chosen so that the depth of field includes all the elements of interest, depending on the chosen shooting procedure. As a rule, in wide-angle photography, wide-aperture photography is not practiced, except in low light conditions, because forensic photography does not require the separation of the subject from the background, as is practiced in portrait photography. On the other hand, shooting at high aperture values is also not recommended, as the optical phenomenon called diffraction will occur, which affects the image quality.

The exposure time will be chosen according to the photographed scene, so that the photographed subject is clearly captured, frozen, and motionless. Therefore, if the scene is static and the lighting conditions are favourable, it will be photographed by hand, in this situation the longest recommended exposure time being $1/2 \times$ focal length. For example, if shooting at a focal length of 50mm, the maximum recommended exposure time will be 1/100s. However, it can be overcome if the user has dexterous hands, if the lens is equipped with a vibration reduction system, or if the camera is equipped with an image stabilization system. If the scene is static, but the lighting conditions are not favourable, a tripod will be used, on which the camera will be mounted. With the tripod, images can be taken at a long exposure time. For dynamic scenes, the shutter speed must be chosen both according to the movement of the camera and the speed of movement of the subject.

The recommended ISO value is the minimum, as raising it will affect the quality of the photo. However, cameras are equipped with increasingly high-performance sensors, and the use of a high ISO value may be absolutely necessary in certain situations, such as flagrant crime (dynamic scene) shooting in low light conditions. Finally, all these three parameters are in full agreement and influence the exposure and image quality.

Inaccurate focusing

In common parlance, “a blurred, unfocused photograph” is a photograph whose subject is not in the depth of field. Although cameras are equipped with high-performance focusing systems, there are many situations in which such photos appear. The sources of this problem are diverse: camera movement, subject movement, low light conditions, and focus errors caused by lenses or cameras. A general solution to avoid focusing problems is to use a closed aperture so that the depth of field allows the camera or/and the subject to move and does not lead to their exclusion from the depth of field. Another solution to prevent this problem, especially in the case of static scenes, is manual focusing.

Regarding dynamic scenes, where the subject is in constant motion, I consider that the equipment with which photography is played plays an extremely important role, as only the lenses and cameras in the professional range are equipped with the appropriate focusing systems for such scenes. For the highest chances of success, it is recommended to switch the focus system to continuous focus, using all available focus points and shooting in burst mode.

Focusing in low light conditions can create difficulties, whether done manually or automatically. For this reason, some camera models are equipped with a focusing lamp. If this lamp is non-existent, the photographer can use any artificial light source, such as lamps, telephone flashes, flashlights.

Station point

The first rules regarding the choice of the station point were created by Alphonse Bertillon, the creator of the aforementioned mug shot photography process. His rules required that, in the case of photographing those who committed crimes, they be photographed from the front and in profile, so that the photographs capture as many facial features as possible, from two different angles.

Today, in specialized works, it is often recommended to choose a certain station point. For example, in the case of orientation photography, it is considered that the camera should be placed as high as possible, sometimes even using aerial photography. Likewise, the process called the photography of the main objects requires the photography of the corpse, the weapon and other objects from the perpendicular plane. Footprints found in the criminal field are photographed both individually to measure the size of the footprints and reveal the footprint or shoe, and as a whole,

to indicate the direction and direction of the perpetrator, recommending that the camera be positioned above the traces, in a plane position parallel to the trace.

As an exception to these rules, it is proposed to choose the station point carefully, even if it leads to a violation of the general rules mentioned above, as it is advisable to avoid large objects covering the small ones (Aionițoaie et al. 1992, 68).

The choice of the station point directly influences the visual estimation of the dimensions of the captured objects or spaces, as well as their proportions. It is necessary to mention that the use of a wide-angle lens and the choice of an inappropriate station point can lead, together, to the appearance of some geometric distortions.

Conclusions

Over time, various rules and recommendations have been formulated in the specialized works, including some that do not find universal applicability. For example, in some works it is recommended that, in the case of sector sketch photography, the photographs be taken with the same settings, which is totally detrimental to the photographs in the hypothesis that the rooms would have different lighting conditions.

The only rule that knows no exceptions and from which it cannot deviate is the one that requires that photographs capture honestly, as faithfully and objectively as possible the reality of reality, since they must serve to find out the truth. At the same time, it should be mentioned that the photos can serve as evidence in the civil process, which seeks to repair the damage caused.

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