

New Perspective of an Event Using Frame-By-Frame Analysis of Video Footage

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Abstract

When video cameras become more and more common, the police investigators are using their output many times as concrete evidence to prove a crime or felony. But looking at a raw footage might bring them to the wrong conclusions. In this article, a case is introduced where breaking one second of video footage into 36 still frames told another story, which led to lenient verdict.

Introduction

A man was awakened at midnight to the noises of someone breaking into his pickup truck. He stepped out of the motorhome he was sleeping in, which was parked just behind the truck, only to discover someone inside the vehicle, trying to steal it.

The man pulled out a Beretta 92 9x19mm gun, which he was licensed to carry, and shot at the thief through the rolled up passenger window of the truck, killing him with a head shot. The incident was captured on video by the man's security camera, and subsequently seized by the police. (**Pic. 1**)

The man was indicted with a charge of voluntary manslaughter, a crime punishable by up to twelve years in prison. The authors of this paper were called by the man's defense attorneys to try and help them with what seemed to be an open-and-shut case!

The Investigation Procedure

Looking at the entire video footage, it appeared there was no escape from concluding there was an "execution style" shooting and the shooter was indeed guilty of the charges filed against him. However, "breaking down" the **one** second, in which the shooting occurred, to 36 individual frames, showed a different story.

As one can see in **Pic. 2**, the truck was parked almost parallel to the sidewalk. When the thief broke into the truck, a mirror light came on, illuminating the cabin & making it possible to see everything inside. As soon as the perpetrator saw the man with the gun, he closed the door, shutting off the inside light, and started moving the car to the center of the road, away and

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forward relative to the man! That proved to be a very important fact when the whole sequence was analyzed in its entirety.

In order to understand what happened, before the shooting as well as at its exact moment, the event was “reconstructed” at the same place and time with the same truck and another person "playing" the thief.

The bullet’s entrance point through the truck's right passenger window was marked. **(Pic.3)**
The entry wound on the "thief's" forehead was also marked. **(Pic. 4)**

The car was then moved slowly forward and to the left, towards the center of the road. The “thief” was asked to align the entry wound marking on his forehead with the circle of the entrance hole in the window and the line of the gun's barrel. **(Pic.5)**

When examining the whole picture **(Pic. 6)**, one can see that the thief had to lean down and look in the shooter’s direction. That, in conjunction with the forward motion of the truck, brought him into the line of fire which caused his death. If he had stayed in place, not moving the truck, sitting upward, he would not have been shot as the gun was pointed in front of him! In other words, he drove himself into an oncoming bullet.

When this evidence was presented to the prosecutor and the presiding judge, the state agreed to halt the criminal process, and begin mediation proceedings. Subsequently, the punishment was reduced and the man was sentenced to nine months of community service, meaning he had to volunteer somewhere for this period of time.

Conclusions

Trying to learn about a split-second event from raw video footage, might lead investigators and prosecutors to the wrong conclusions.

"Breaking down" this split-second event frame-by-frame for in-depth analysis, can reveal many more details not readily apparent in the fast-moving video.

Recreating the event as it actually happened and showing it to the prosecutor and judges, can change the outcome of the criminal procedure.



Pic. 1 – The moment of the shooting.



Pic. 2 – The truck parked parallel to the sidewalk.
It is possible to see the thief inside



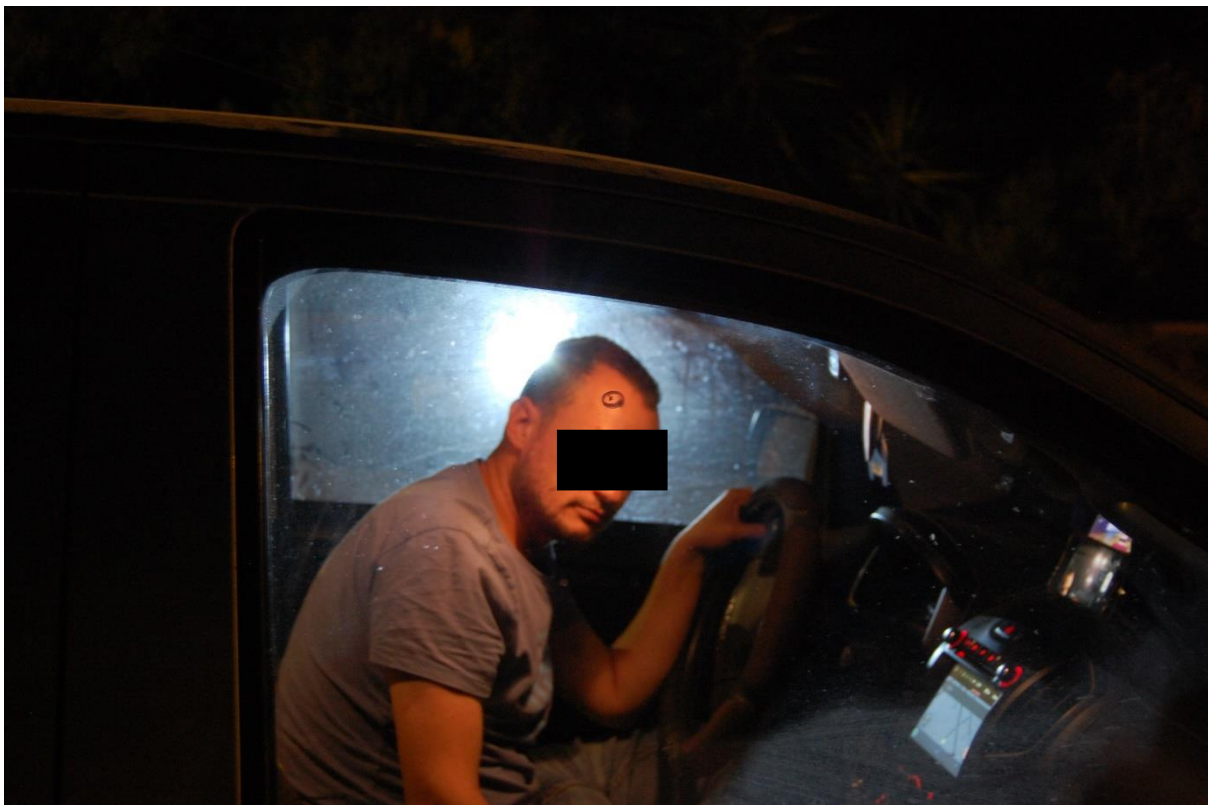
Pic. 3 - The thief's position while the cabin light is on. The white circle marks the entrance point of the bullet.



Pic. 4 – Marking the bullet's entry hole on the thief's forehead.



Pic. 5 – Alignment of bullet's entry holes in the window and the thief's forehead.
The picture was taken from the gun barrel's "line of sight".



Pic. 6 – The position of the thief when he was hit by the bullet.