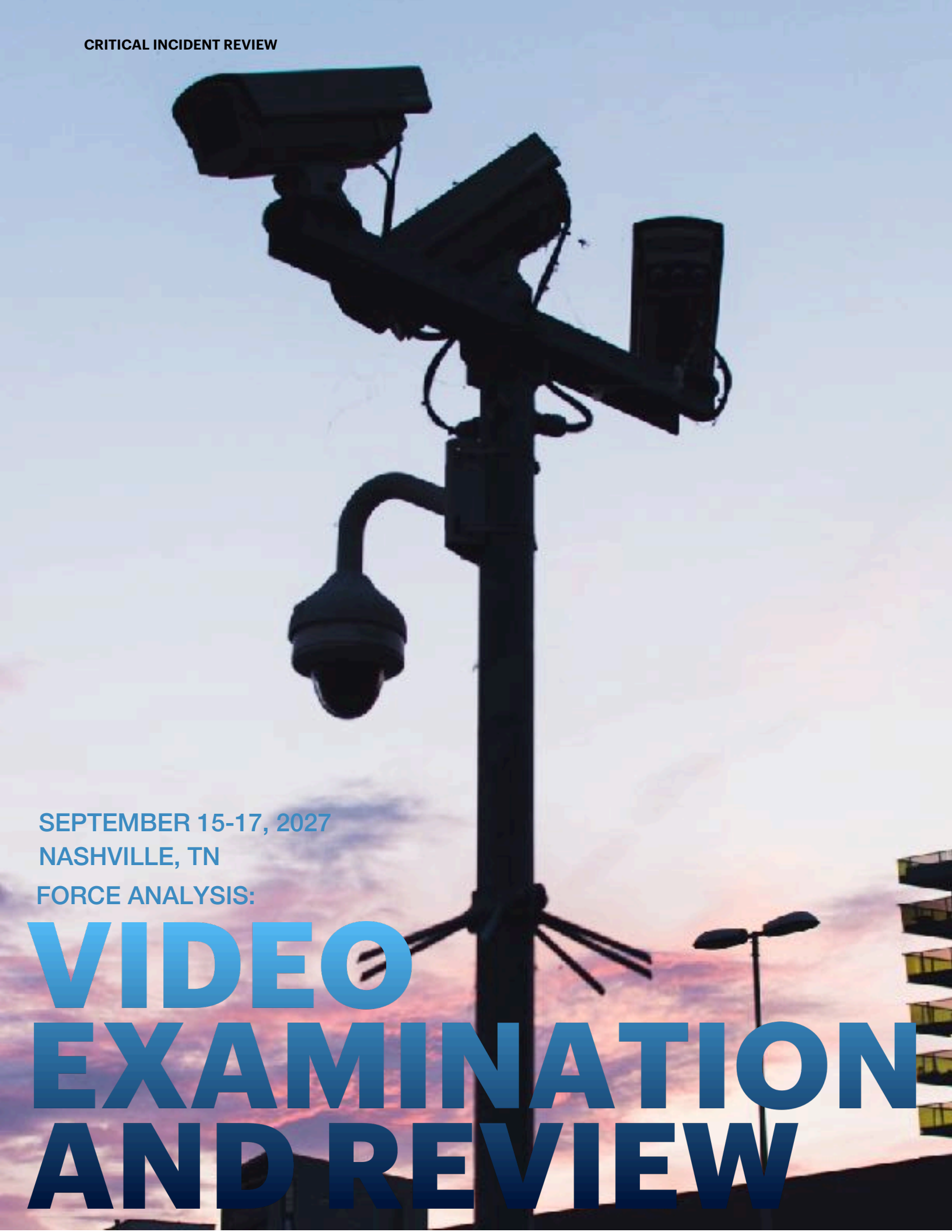

SEPTEMBER 15-17, 2027
NASHVILLE, TN

FORCE ANALYSIS:

# VIDEO EXAMINATION AND REVIEW

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# THE IMPORTANCE OF VIDEO EXAMINATION & REVIEW

As a force investigator, it is your responsibility to ensure evidence (like video) is properly reflected in your report.

Simply watching a video and reporting what you see can…and has, led to officers being fired and criminally charged. Training can easily fix that.

Whether it's from a body camera, or surveillance camera, video is technical and can be deceiving. As the investigator, you must understand it.

## THE FORCE ANALYSIS: VIDEO EXAMINATION AND REVIEW COURSE

C.I.R. has purpose-built a new course specifically for force investigators that use video and audio evidence. The training combines and teaches four aspects that you must know as a force investigator:

- Use of force principles: Apply the standards of a reasonable officer to the evidence.
- Human factors related to video: Learn how officers commonly respond in force incidents, and how this is reflected in video evidence.
- Technical video examination: Easily learn the technical details you need to know to accurately review and examine video.
- Video review techniques: Learn the techniques to identify issues and report the details of a video proficiently and accurately.

You will quickly learn:

Technical Examination: Investigators will learn important technical information that turns data into video and what it means. Investigators will also learn:

- How video is encoded and recorded
- Errors that occur in digital video
- Available forensic video software
- Making a reasonably accurate timeline.
- Discover free software and specialized software for video examination
- How to use video and audio for timing purposes

Video Review: After you have a grasp of the technical information, you will then learn the techniques to extract as much data as possible to conduct a thorough and complete force investigation using video & audio data. Investigators will learn to:

- Identify the limitations of video

- Capture digital images for the investigation
- Compare video to available evidence and statements
- Techniques for video examination

Human Performance: Once you understand the technical information, and how to review video, you will move on to:

- Apply use of force and police standards
- Integrate police performance factors and simple scientific principles to your video examination

This will help you and decision-makers better understand what they are seeing on video in instances of:

- Controversial shot placement
- Identifying decision-making windows of time
- Issues around the time to start & stop shooting
- Action v reaction
- Threat assessments in the moments preceding the use of force

At the end of the class, you will be able to:

- Competently examine and review video specifically for the purpose of force investigations
- Explain and document the process for analyzing, examining video, and presenting video evidence
- Accurately apply use of force and policy standards to the digital evidence.

You'll also learn:

- How biases and knee-jerk reactions can, and often do, contaminate an investigation.
- How crucial, life-changing details are often missed due to misunderstanding or misinterpreting the evidence.

We'll go step by step to avoid these traps.

You will also get hands-on training to develop the needed skills to professionally obtain, examine video, and report on video evidence to the citizens, courts, and your administration.

## EQUIPMENT REQUIREMENTS:

While you're in the class, you will use forensic software to examine video and will need your own computer. The system requirements are:

- Windows 10, 64bit or above
- 8 GB of RAM, but more is better
- Wi-Fi/Internet connection, for a demo software license
- Agency permissions on the computer to download and install the software

Approximately two weeks prior to the beginning of class, the software will be released to registered guests so they can work with their IT Departments to get the software installed.

In the event you do not have your own computer, you can still partner with another attendee or follow along with the instructor.

## ABOUT THE INSTRUCTOR:

Jamie Borden is a retired Police Sergeant from Henderson, Nevada, the state's second-largest city and part of the Las Vegas Metropolitan area. He is a court-certified expert in Use of Force, Police Practices, and Forensic Video Analysis.

Jamie has reviewed thousands of force incidents and has been an expert in over 400 civil or criminal law enforcement use of force cases. He travels the country teaching thousands of officers, attorneys, and civilians the lessons learned from each of those cases.

He is both highly trained and experienced in police performance factors related to training and decision-making, video analysis, training, and police use of force.

## FREQUENTLY ASKED QUESTIONS:

**Are there other classes like this?** The short answer is no. Here's why: Most video classes are about video in general and not specifically related to use of force. These classes tend to instruct you mostly on information that is not related to force investigations.

Classes related specifically to force are usually lectures, and are not hands-on workshops. So, the knowledge transfer is minimal, and you do not develop skills in these classes.

**Is it my role as an investigator to examine video?** That depends. If your agency has a forensic video analyst, then it may not be. However, video analysts are usually not trained in force investigations, human performance, and force standards.

We still recommend this training to ensure you provide input and guidance to the video analyst to provide specific information from the digital evidence.

If your department does not have a trained and designated video analyst, this class is crucial to a proper force investigation. You simply cannot watch a video and take it at face value.

## CLASS DETAILS

**Dates:**
September 15-17, 2027. 0800-1700 Daily.

**Location of the Class:**
Metro Nashville PD, 1281 Murfreesboro Pike, Nashville, TN 37217

**Nearby Airport:**
Nashville International Airport (BNA)

**Host Hotel:**
C.I.R. does not have a host hotel; however, we recommend the following locations:

Sheraton Music City Nashville Airport | 615-885-2200
777 McGavock Pike, Nashville, TN 37214
3 miles from training venue (7 minute drive). WEBSITE HERE

Hyatt House Nashville Airport | 615-871-9500
14 Century Blvd, Nashville, TN 37214
4 miles from training venue (8 minute drive). WEBSITE HERE

**Registration:**
You can register several ways.

1. **Mail-In:** Complete and mail the attached registration form (instructions included). Once we have it, you'll get a confirmation email.
2. **Pay Online or via Invoice**: Attendees can register on the C.I.R. website and pay with a credit card or select to pay via invoice HERE.

**Fee:**
$997 Per Person

**What Happens Next:**
After you register, you will receive a confirmation email. Approximately 2 weeks prior to the class beginning, you will receive instructions to log into the training portal for early learning and reviewing the needed material for the course.

**Questions:**
If you have any problems during the registration process, email us at contact@criticalincidentreview.com

# Force Analysis: Video Examination and Review

1. **SGT. JAMIE BORDEN (RET.), H.P.D.**
   **VIDEO TAPE REVIEW: What is digital video**
   - **a.** Determining an officer's focus of attention; is it possible from digital video alone?
   - **b.** Focus of attention
     - i. KEY TO SELECTIVE ATTENTION & INATTENTIONAL BLINDNESS

2. **UNDERSTANDING DIGITAL VIDEO**
   - **a.** The knowledge of digital video;
   - **b.** Introduction
     - *i. Technical aspects and understanding the limitations of video, video analysis*
   - **c.** Research
     - ***i.*** ***<u>What is important?</u>***
       1. Distance Distortions
       2. Frame rates
       3. Encoding process
     - ***ii.*** ***<u>What is for sale?</u>***
       1. Cameras?
       2. Storage?
       3. Service?
     - ***iii.*** ***<u>Identify the purpose of implementing cameras</u>***
       1. Define the purpose
       2. How will your department employ BWC
     - ***iv.*** ***<u>Transparency</u>***
       1. This creates a monumental level of responsibility and understanding regarding the implications
       2. Consider other planned uses of video & potential unplanned uses
     - ***v.*** ***<u>Intended uses of BWC footage</u>***
       1. On scene review

2. *Spot check (professionalism)*
3. *Identification of training*
4. *Force Analysis*
5. *Video Examinations (forensic)*

***vi.*** ***<u>Un-intended use of BWC footage</u>***

1. *Viral social media effect*
2. *"Knee jerk" reaction from city government*
3. *Un-fair representation of an incident*
4. *Damaged investigation; criminal/civil*

***vii.*** ***<u>Spot-checking shift video</u>***

1. *looking for policy violations*
2. *Speed activations*
3. *Inappropriate behavior*
4. *Emergency activations*

***viii.*** ***<u>Looking for successes</u>***

1. *Citizen contacts*
2. *Tactical protocols*
3. *Driving standards*

***ix.*** ***<u>Automatic activations of MAV or BWC</u>***

1. *Speed* activations
2. *Code* three activations
3. *Accelerometer* activations
4. *Remote* activations!?!?

***x.*** ***<u>Budget constraints</u>***

1. Manning work load issues
2. Additional associated tasks
3. IT personnel dedicated to the system
4. Trainers developed to implement the system
5. Freedom of information act, evidence redaction
6. Uniform updates
7. Officer video review
8. Supervisory video review and spot-checking
9. Possible need for a dedicated UOF Unit

***xi.*** ***<u>Video in Law Enforcement</u>***

1. Primarily intended for "transparency"
2. Often if not always used as evidence
3. Mis-interpreted in most cases

xii. ***<u>Concerns</u>***

1. Training
2. technical analysis v. technical review
3. technical review (specialized area of expertise)
4. State laws (privacy issues)
5. local followup
6. FOIA act
7. transparency
8. Union issues – This is not a plug and play endeavor
9. how does this affect officers rights
10. how is it congruent with the existing investigative process
11. is the Union participating and has it been vetted by legal

**3. THE NEED TO DEVELOP UOF AND VIDEO SPECIALISTS**

i. ***<u>Developing a specialist in</u>***

1. Legal issues
2. Use of Force
3. Policy writing and review
4. Video analysis

**4. DIGITAL VIDEO (A TECHNICAL PERSPECTIVE)**

***i.*** ***<u>Overview Understanding the technical aspects of video</u>***

1. Frame rates (fps) refresh rates
2. timing issues and interval sampling
3. Encoding/Decoding – codec
4. predictive and bi-directional encoding
5. Transcoding
6. spoliation and damaged video evidence

7. technical analysis
8. Artifacts
    a. Note: distortions, how does this affect your examination review and analysis
9. Compression
    a. Note: distortions, how does this affect your examination review and analysis
10. Progressive scan and interlacing
    a. Note: distortions, how does this affect your examination review and analysis
11. Video timing and the use of clocks or timers
    a. Note: time -distance- speed - motion, how does this affect your examination review and analysis

**5. VIDEO IS PROLIFIC EVIDENCE**

i. ***Note***: ***primary perceptions with video evidence***

1. Digital video must be understood
2. Video content must be interpreted
3. Refresh Rate
4. Frame rate (fps)
    a. Standard is 30 (fps) / 29.97 (fps)
    b. Refresh rates are often variable
    c. Important to understand and identify variable frame rates for UOF and speed analysis, possible missing information, etc.

6. **INTERPOLATION** - what is being added and why

**7. ENCODING/DECODING**

i. ***Codec***- encodes and decodes visual data, includes the codec for encoding audio, although audio is a separate stream

1. An algorithm encodes, compresses and decodes the information
2. Must use the same codec to decode that which was used to encode

3. Encoding process
    a. Codec encodes the file when it converts visual information (light) into 0's and 1's
4. Compression
    a. a process that happens at the source
    b. Nearly all compression algorithms are destructive or "lossy"
    c. Detail is lost and unwanted artifacts are introduced
    d. Repeated decoding and encoding results in cumulative generational loss
    e. When to Compress?
    f. When data storage or streaming bandwidth is limited
    g. When long streams of data are recorded, such as surveillance systems
    h. When Not to Compress?
    i. When data storage or streaming bandwidth is not a limitation
    j. When maintaining image quality is important, such as when editing video or using as forensic evidence
    k. Backwards recommendations not suitable for providing the "best" evidence
5. Encoding
    a. A representation of information in other form

ii. Compression
1. To lessen the number of symbols to represent a given piece of information
    a. This process is not meant to conceal or hide information
    b. Exploits redundancy to reduce file size
    c. May be mathematical or physiological
    d. example; Humans don't generally hear beyond 20-30kHz, so that may be stripped out of the information stored

iii. Containers
    a. Play various codecs
    b. .MPEG (Motion Picture Experts Group)
    c. .AVI (Audio Video Interlace)
    d. .MOV (Apple, Quicktime)
    e. .MP4 (MPEG-4, YouTube recommended format)

f. .H264 (Video compression codec)
g. .FLV (Flash Video Format)
h. .WMV (Windows Media Video)
i. .EXE files
j. Downloading the .EXE will leave remnants
k. The next similar codec may use a remnant from the previous .exe
l. i.e., possible different directive;
m. 100 frame GOP v. 15 frame GOP
n. the new attempt will skip frames

**8. ENCODING EXAMPLE**

i. Rolling shutter (picture example)

1. The Process

a. GOP - Group of Pictures
b. I-Frames / P-Frames / B-Frames
c. Encoding order
d. Examples and diagrams
e. Encoding sequence
f. decoding in the same order as encoding
g. Transmission sequence

**9. THIS MEANS THAT DIGITAL VIDEO IS "CREATED" FROM ENCODED DATA**

i. Video is prolific evidence

1. It may or may not affect your analysis

a. Develop an understanding
b. How to apply the knowledge within the scope of the investigation, review and analysis

**10. PERSPECTIVE ISSUES**

i. It may or may not affect your analysis however, it must be understood

a. Distortions
b. Broad field of view
c. Speed distortion
d. Distance distortion
e. Poor perspective translation

**11. PIXEL OR PICTURE ELEMENTS**

1. Square shape w/one solid color
2. The pixel is indivisible
3. Zooming in merely creates a larger single color square

**12. AUDIO**

1. Provides important evidence
2. Officer commands
3. Officer / subject interactions
4. Statements from witnesses
5. Ambient noise
6. In some cases, the only evidence is audio evidence
7. Audio can be useful in deciphering timing issues

**13. CONSIDERING THE INFORMATION WE KNOW NOW……. WHAT?**

i. What information are we looking for

1. Accuracy in statements?
2. Truthfulness issues
3. Corroborative evidence
4. Movement/motion
5. Time/speed
6. Distance
7. Force

**14. VIDEO TIMING AND OTHER POTENTIAL ISSUES**

i. Is the shooting controversial based on timing issues?

1. Is the suspect injured, shot in some other area than is expected
2. What is the reviewer's expectation?
3. What is the involved person's expectation?

4. What issues might be considered in the visual principles
5. Can these issues be identified in video format?

## 15. HUMAN EYE V. THE CAMERA LENS

i. The human eye

1. Perception of information received in the form of light
2. Emotionally flat until treated by our interpretation

ii. The camera lens

1. Encodes light captured by the sensor into data.
2. Turning photons into electrons for digital processing -digital information-
3. We also visually and emotionally interpret digital information captured by the camera
4. Low Light Capabilities
5. In low-light situations, the processor applies noise reduction algorithms to reduce graininess caused by amplification
6. Can reduce sharpness
7. affects the color values as received by the digital sensor
8. The human eye is not equipped with low light capabilities

## 16. VIDEO REVIEW AND ANALYSIS

i. CAUTIONS

1. Unlike what you see in the movies, what we can do with video enhancement is limited
2. Typical enhancements include enlargement, contrast enhancement, noise and artifact reduction, deblurring and frame comparison/averaging
3. Timing issues
4. understanding and applying
5. human factors
6. and human performance

**17. KNOWLEDGE ASSISTS IN THE NAVIGATION OF STATEMENTS THAT SPELL TROUBLE**

i. *"THIS VIDEO SPEAKS FOR ITSELF "I DON'T NEED AN EXPERT TO TELL ME WHAT I CAN SEE WITH MY OWN EYES"*

1. These statements can be damaging
2. EYE-BALLING VIDEO
3. Video shows you what you want to see
4. Viewer bias

**18. VIDEO REVIEW IS AN EMOTIONAL CONDUCTOR**

i. In most cases the decision makers will believe the video evidence over the officers statement

1. Emotional instigators
2. Ethnicity
3. Verbals
4. Unfiltered uploads/Narration
5. Media Hype / Framing / Bias
6. Verbal content will override the reality of action what you hear can override what you see.
7. Important for Officers on the street as well as investigators

**19. WHAT IS THE REALITY OF "FOCUS OF ATTENTION" WHEN YOU'RE IN THE ACTION V. REVIEWING OR ANALYZING THE VIDEO**

i. Why do we need to consider "Limitations?"

1. In digital video analysis
2. In Human Factors & Human Performance
3. Our own expectations!
4. Investigations & Limitations considerations
5. Keep in mind the limitations of video, this is an exacting science and should be performed by experts in the field

**20. CONSEQUENTIALISM VIEWER BIAS**

i. Who is susceptible to Consequentialism & Viewer Bias

## 21. REVIEWING TECHNIQUES TO CONSIDER

i. Watch video globally
    1. Let the emotional instigators have an effect

ii. Watch without sound

iii. Move on to interrogate the video evidence
    1. Focus on the 4 corners (separate viewings)
    2. Pick areas of interest and stay focused on that thing.
    3. The most experienced investigators must be aware of their own bias.
    4. how is it defeated
        a. Remove advocacy
        b. Find and report facts
        c. backed with a knowledge of limitations
        d. What is the viewer's expertise

- Use of Force
- Police Practice
- Human Performance
- Video examination
- Video analysis
- Developing a working knowledge of digital video and the associated terms and processes What level of knowledge regarding digital video is necessary to review and analyze video content?
- Interrogate the video

As investigators and force analysts, we need more than the ability to identify surface-oriented issues directly related to an officer's actions. We don't automatically and intrinsically believe a witness's account of an incident, we cannot intrinsically believe the data contained in a video.

Video is a witness. Video evidence must be challenged. The facts may not be as readily available without a deeper analysis of the digital video process. Investigators must be able to:

- Accurately and reliably examine video for the purpose of movement analysis and to further force analysis and force investigations.
- Develop proficiency in conducting basic digital image capture.
- Accurately produce sub-clips of relevant video data from larger files.
- Test, define and articulate the technical limitations of proprietary digital video players.
- Discover techniques to determine accurate image refresh rates for the purpose of determining timing and other issues related to motion and force, and for speed estimation.
- discover effective free-ware and specialized COTS software for the purpose of producing reliable images and to write accurate reports, defining processes, and displaying video and still images
- Discover expedited techniques to quickly and accurately produce reliable sources of video evidence that will be easily played in industry standard players for court purposes.

# Force Analysis: Video Examination and Review

**September 15-17, 2027**

Metro Nashville PD, 1281 Murfreesboro Pike, Nashville, TN 37217

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Agency:_____

Street Address:_____

City:_____

State:_____ZIP:_____

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