**Medex Forensics**
634 W. Main Street, Suite 202
Madison, WI 53703
www.medexforensics.com

# Medex Forensics Advanced Video Forensic Course

## Course Description

The Advanced Video Forensics Course is a five-day advanced course designed to give forensic examiners and analysts a deep understanding of digital video technology and enable them to answer complex questions about video evidence.

Students will gain foundational knowledge of how digital video is encoded and stored in order to provide an expert analysis of it.  This course will also focus on the authentication of digital video and identifying the source of unknown video files.  A variety of cell phone captured and transmitted video, as well as cloud and social media stored files will be utilized to effectively interpret and gain insight into video from various sources.  Open source tools as well as the Medex Forensics video examination tool - Medex will be featured to give students real world insights into practical use cases.

## Course Objectives

Upon successful completion of this course, the student will be able to:

- Understand how digital video files are constructed at a binary level
- Manually decode and gain insight into file metadata
- Perform complex video authentication examinations
- Determine specific elapsed time differences in variable frame rate video
- Forensically acquire data from cloud based and social media sources
- Repair corrupted video files

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## Course Details

| Module | Description and objectives |
|---|---|
| Introduction (Day 1) | ● Identifying the current landscape and capabilities in video analysis<br>● Core concepts for forensic analysis and expert testimony<br>● Introduction to binary and hexadecimal data |
| Digital Video File Construction (Day 1) | ● Identifying digital image and video specifications<br>● Understanding video file structures<br>● Encoding/decoding video data at a byte level |
| Decoding Metadata (Day 1-2) | ● File vs. filesystem created metadata<br>● Potential pitfalls using metadata analysis tools<br>● Manual decoding metadata<br>● Analyzing file timestamps |
| Video Authentication (Day 2-3) | ● Content based authentication<br>● Non-content based authentication<br>● Analysis of unknown files<br>● Authentication of social media video<br>● Provenance identification |
| Frame Timing Analysis (Day 3) | ● Identifying frame timestamps<br>● Accurately calculate elapsed time with variable frame rates<br>● Understanding frame presentation order |
| Cloud/Social Media Acquisition (Day 4) | ● Concepts of cloud stored video<br>● Acquisition of accurate/best quality video<br>● Experimental design for emerging platforms |
| Damaged File Repair (Day 4) | ● Identification of elements required for playback<br>● Locating damaged sections of video files<br>● Repairing files |
| Generating Conclusions (Day 5) | ● Examining data validity<br>● Technical limitations of analyses<br>● Expressing opinion in an expert report |
| Hands-On Practical Exercise (Day 5) | ● Students are provided with a scenario<br>● Students use practical skills learned to acquire video from different sources and authenticate video |
| Hands-On Practical Analysis and Reporting (Day5) | ● Students will analyze the previously acquired video for investigative insight and knowledge about provenance<br>● Students will develop an expert report based upon the conclusions of their analysis. |

# Medex Forensics Advanced Video Forensic Course

## Instructional Team

**Brandon Epstein - Chief Forensic Officer, Medex Forensics**

Brandon Epstein has served in law enforcement since 2007 and has been a digital forensic examiner since 2014.  Brandon holds a Master of Science degree in Recording Arts – Emphasis Media Forensics and is a Certified Forensic Video Analyst (CFVA) and Certified Forensic Video Examiner (CFVE). He is the chair of the Scientific Working Group on Digital Evidence and is a member of the IAI's Forensic Video Certification board, IACP Cybercrime and Digital Evidence committee, the American Academy of Forensic Science, and the NIST/OSAC Video/Imaging Technology and Analysis Subcommittee.  Brandon is an adjunct professor in the New Jersey Institute of Technology's Forensic Science Program and regularly provides digital forensic instruction to local, state, and federal law enforcement officers nationwide and internationally.

**Bertram Lyons - CEO, Medex Forensics**

Bertram Lyons has over 20 years of experience in digital assets and data, specializing in the acquisition, management, and preservations of evidential, documentary, research, and other critical data types.  Bert's extensive experience include previous roles at the Library of Congress as well as projects for organizations including the FBI, Smithsonian Institute, HBO, Paramount Pictures, Facebook and Spotify.  Bert is an Associate Member of the American Academy of Forensic Sciences (AAFS) and an active member of the Scientific Working Group on Digital Evidence (SWGDE). He has received certification from the Academy of Certified Archivists and is a graduate of the Archives Leadership Institute. He holds an MA in museum studies with a focus in American studies and archival theory from the University of Kansas.