

NICK BARREIRO BAC, AVFA, DIVRT

Chief Forensic Analyst
615-854-8055
nick@principleforensics.com

Principle Forensics
6688 Nolensville Rd, Suite 108-129
Brentwood, TN 37027

CURRICULUM VITAE

CERTIFICATIONS

Certified Audio Video Forensic Analyst – AVFA
Electronic Technicians Association

Digital Imaging and Video Recovery Team – DIVRT
Federal Bureau of Investigation

EXPERT DISCIPLINES

Video, Audio, and Image Forensics

- Evidence Recovery
- Authentication
- Enhancement
- Synchronization
- Analysis
- Redaction
- Photogrammetry
- Facial Recognition
- License Plate Recognition
- Public/Media Release
- Court Exhibit Preparation

EDUCATION

Yuba College Administration of Justice
Police Academy
Marysville, CA

2006

University of California at Davis
Major in Communications
Davis, CA

1998 - 2002

CONTINUING EDUCATION & TRAINING

Advanced Forensic Audio Analysis & Processing

December 2, 2022

Resolution Video

- Advanced audio enhancement processes
- Multitrack mixing and editing techniques
- Batch processing of audio files
- Accurately capturing audio from proprietary players and websites
- Audio streams from video sources: stripping, muxing, synchronizing, and timing issues
- Background noise removal using cross-channel adaptive filtering
- Gunshot audio signal analysis

Adobe Premiere for Forensic Video Analysts

November 8 - 10, 2022

Resolution Video

- Understanding the forensic video analysis workflow with Adobe Premiere
- Advanced toolset and filters for examining video evidence
- Utilizing Premiere to create and synchronize video timelines
- Processing techniques that enhance the quality of video evidence
- Methods for redacting video and audio for public release
- Producing derivative evidence and demonstrative products

Advanced Forensic Audio Enhancement & Processing

May 9 - 12, 2022

University of Colorado Denver, National Center for Media Forensics

- Deep exploration of digital multimedia processing
- Forensic audio equipment, software, and methods
- Advanced techniques for enhancing recorded audio
- Filtering, noise reduction, and cross-channel adaptive filtering
- Audio processing for increased intelligibility
- Working with audio files from video recordings
- Batch processing with ffmpeg and other command line utilities

LEVA Digital Multimedia Evidence Training Symposium

October 18 - 22, 2021

LEVA International, Inc.

- Interactive video authentication
- Detecting image and video manipulations
- Integrating video data from disparate sources
- Photogrammetry and error calculation
- Calculating distance, time, and speed from digital video
- Emerging digital evidence considerations, challenges, and opportunities
- Report writing fundamentals for forensic video analysis
- Courtroom trial preparation of technical evidence

Adobe Photoshop for Forensic Video Analysts

May 10 - 13, 2021

Resolution Video

- Maximizing image quality when exporting a forensic video image
- Workflow efficiency for processing images from video evidence
- Pixel aspect ratio correction techniques
- De-interlace options, and basic image adjustments
- Photogrammetry, measurements, reverse projection, error calculation
- Custom filters for de-blurring, sharpening, and pattern elimination
- Applying color isolation processes for image clarification

Digital Video Forensics

May 3 - 5, 2021

eForensics, Hakin9 Media

- Contemporary video forensic technologies and processes
- Video forensic investigation procedures
- Technical issues related to digital video processing
- Video content authentication and forgery/tampering detection
- Digital videos as evidence within and beyond the justice system
- Recovery, enhancement, analysis, and interpretation of video evidence

Forensic Analysis and Enhancement of Digital Audio

March 29 - April 1, 2021

University of Colorado Denver, National Center for Media Forensics

- Practical fundamentals in digital audio theory
- Forensic audio handling and enhancement
- Digital evidence tools and noise reduction
- Recovery of digital audio and stereo source separation
- Spectral tools for forensic analysis
- FFT spectrum and spectrogram

Forensic Analysis and Authentication of Digital Audio

March 15 - 18, 2021

University of Colorado Denver, National Center for Media Forensics

- Digital audio authentication techniques
- Admissibility of digital audio evidence
- Counterfeit detection and digital data analysis
- Compression level analysis
- ENF collection and comparison

Forensic Analysis and Authentication of Digital Images

March 1 - 4, 2021

University of Colorado Denver, National Center for Media Forensics

- Authentication of digital images and manipulation detection
- Image evidence admissibility
- Image manipulation detection
- EXIF data analysis
- Recompression analysis
- Photo response non-uniformity

Robbery Investigation (ICI)

September 30 - October 4, 2019

Robert Presley Institute of Criminal Investigation

- Video evidence analysis
- Examination of robbery case studies
- Elements of the crime, developing patterns, and dynamics
- Techniques and strategies to develop a successful investigation
- Interpretation and application of laws related to robbery
- Suspect identification techniques
- Courtroom testimony

Digital Imaging and Video Recovery

March 19 - 20, 2019

Federal Bureau of Investigation

- Video forensics
- Evidence retrieval from digital video recorders
- Documentation of critical system information
- Preservation of collected evidence
- Enhancing video evidence
- Considerations when releasing video to the media

Homicide Investigation (ICI)

January 21 - February 1, 2019

Robert Presley Institute of Criminal Investigation

- Evidence collection, crime scene analysis, and chain-of-custody
- Electronic investigations and video forensics
- Arson and terrorism investigations
- Forensic pathology, odontology, entomology, and anthropology
- The role of the media
- Interpretation of homicide law and preparation for testimony

Officer-Involved Shooting/Force Investigation (ICI)

December 10 - 14, 2018

Robert Presley Institute of Criminal Investigation

- Critical incidents: officer-involved shootings, use of force, etc.
- The importance of video forensics in critical incidents
- Contemporary critical incident case studies
- Administrative investigations, legal considerations, media relations, and courtroom testimony

Death Investigation

May 21 - 22, 2018

3rd Degree Communications

- Legal issues in death investigation
- Crime scene management
- Officer-involved shootings and in-custody deaths
- Wound recognition, apparent suicide, and apparent accidental death
- Evidence recognition, photography, and documentation

Robbery Investigation

November 14, 2017

3rd Degree Communications

- Management of major robbery investigations
- Surveillance video and evidence collection
- Identification of crime patterns and resources
- Suspect identification, interview, and interrogation techniques

Electronic Surveillance

June 9, 2017

State of California Department of Justice

- Electronic surveillance and pen registers
- Intercepting and recording wire communications
- Practical and tactical aspects of operating and monitoring a wiretap

Criminal Investigation Core Course (ICI)

January 9 - 20, 2017

Robert Presley Institute of Criminal Investigation

- Surveillance techniques, interview and interrogation
- Crime scene management and reconstruction
- Search & seizure law and preparation of search warrants
- Documentation, case management, case presentation
- Courtroom testimony

FaceSearch Facial Recognition

July 28, 2016

Vigilant Solutions

- Forensic facial recognition technology and databases
- Image comparison and facial identification
- Filtering and editing techniques

Critical Incident Response

March 5, 2015

South Bay Regional Public Safety Training Consortium

- Developing, initiating, and executing a response plan
- Significant acts of violence and terrorism
- Active shooters and mass casualty incidents
- Critical incident case studies

Cybersecurity

October 28 - 29, 2014

Department of Homeland Security

- Cybersecurity vulnerabilities, risks, threats, and countermeasures
- Critical infrastructure, emergency operations, and incident response
- Unstructured, structured, and highly structured threats

Automated License Plate Reader

September 26, 2014

Central California Intelligence Center, Sacramento RTAC

- License plate reader cameras, databases, and technology
- Fixed and mobile LPR data analysis
- Advanced queries, stakeout, common plate, and geo-fence analysis

WORK EXPERIENCE

Forensics

Principle Forensics, Nashville, TN

Chief Forensic Analyst

2020 - Present

- Forensic Video, Audio, and Image Investigations
- Authentication of Recorded Evidence
- Enhancement and Analysis of Video, Audio, and Images
- Synchronization and Redaction of Evidence
- Derivative Evidence and Demonstrative Exhibits
- Professional Litigation Support
- Expert Witness Testimony

Law Enforcement

West Sacramento Police Department, West Sacramento, CA

Patrol Sergeant

2019 - 2020

- Patrol Supervisor
- Technology Project Manager
 - Media Forensics
 - Body-Worn & Dash Cameras
 - Digital Evidence System
 - License Plate Readers
 - Facial Recognition Technology

Detective

2016 - 2019

- Forensic Video Investigations
- Crimes Against Persons Investigations
 - Robbery, Homicide, Felony Assaults
 - Officer-Involved Shootings

Patrol Officer

2006 - 2016

- Digital Evidence Specialist
- Surveillance Video Recovery Expert

Audio Engineering / Production

KBMB Radio, Sacramento, CA

2001 - 2003

- On-Air Audio Mixing

The Graduate, Davis, CA

1998 - 2002

- Audio Mixing and Production

ACHIEVEMENTS & AWARDS

Audio Video Forensic Analyst Certification

2021

Electronic Technicians Association

Certification in the enhancement and analysis of audio and video digital recordings, handling of evidence in accordance with the highest ethical standards, preparation of expert testimony in the service of justice, industry best practices, and rules of evidence.

- Certificate of Commendation** 2020
 West Sacramento Police Department
 In recognition of exceptional performance of duty utilizing specialized skills in video forensics that were vital in several major investigations and resulted in significant arrests and convictions.
- ICI Certificate of Achievement in Homicide Investigation** 2019
 Robert Presley Institute of Criminal Investigation
 Individuals who have demonstrated a sustained desire, discipline, and determination to refine their investigative craft by devoting approximately 200 hours of training to qualify for an ICI Certificate in Homicide Investigation.
- ICI Certificate of Achievement in Robbery Investigation** 2019
 Robert Presley Institute of Criminal Investigation
 Individuals who have demonstrated a sustained desire, discipline, and determination to refine their investigative craft by devoting approximately 200 hours of training to qualify for an ICI Certificate in Robbery Investigation.
- Digital Imaging and Video Recovery Team Member** 2019
 Federal Bureau of Investigation
 The Digital Imaging and Video Recovery Team (DIVRT) is comprised of state, local and federal law enforcement officers working jointly with FBI's Forensic Audio, Video and Image Analysis Unit (FAVIAU) to provide instruction in the retrieval and dissemination of digital video evidence.
- Commanding Officer's Citation** 2017
 West Sacramento Police Department
 In recognition of dedication, professionalism, compassion, and teamwork in response to a homicide investigation in September of 2017.
- Advanced POST Certificate** 2012
 California Commission on Peace Officer Standards and Training
 Awarded to full-time peace officers who possess an Intermediate Certificate and who have acquired the specified training and education points and/or college degree and the prescribed years of law enforcement experience.
- Intermediate POST Certificate** 2010
 California Commission on Peace Officer Standards and Training
 Awarded to full-time peace officers who possess a Basic Certificate and who have acquired the specified training and education points and/or college degree and the prescribed years of law enforcement experience.
- Basic POST Certificate** 2008
 California Commission on Peace Officer Standards and Training
 Awarded to full-time peace officers who have satisfactorily completed the prerequisite Basic Course requirement and the employing agency's probationary period.

SELECT CASES & TESTIMONY

I have enhanced and analyzed digital media from simple slip-and-fall cases and minor traffic accidents to complex investigations such as homicides and officer-involved shootings. I have also testified hundreds of times in criminal cases, civil cases, arbitrations, and depositions. Below is a small sample of cases in which I was involved:

William Sands vs. District of Columbia et al. (2021-CA-000699-B)

Superior Court of the District of Columbia

Law enforcement excessive force case

- Forensic video authentication
- Forensic video enhancement and analysis
- Timeline sequence reconstruction and synchronization
- Photogrammetry
- Expert witness testimony

Riffel vs. Redding West Senior Living, LLC (19-7446)

Superior Court of California - County of Shasta

Wrongful death case

- On-site surveillance system analysis
- Forensic digital video recorder examination
- Forensic video authentication and analysis
- Timeline sequence reconstruction

Kenneth Frazier Jr. vs. Norfolk Southern Railway Co. (CA-20-C-69)

Circuit Court of West Virginia – County of Mingo

Personal injury case

- Forensic audio analysis
- Forensic audio enhancement
- Expert witness testimony

Rodock vs. Moore et al. (21-2050-DDC-JPO)

US District Court – District of Kansas

Personal injury malpractice case

- Forensic audio analysis
- Forensic audio enhancement
- Expert witness testimony

Rowan Altahrawi vs. Jafar Altahrawi (2019-OP-0002424)

17th Judicial Circuit Court of Illinois – County of Winnebago

Family court case with falsified evidence

- Forensic audio authentication and analysis
- Detection of evidence tampering
- Expert witness testimony
- Falsified evidence excluded

State of North Carolina vs. James William Durner (21-CR-50487)
Superior Court of North Carolina – County of Carteret
Homicide case

- Forensic video enhancement
- Forensic video analysis
- Court exhibit preparation

Officer-Involved Shooting of Jonathan Ramirez (OPD-20-054365)
Oakland Police Department, California

- Forensic video authentication
- Forensic video enhancement and analysis
- Forensic audio analysis
- Timeline sequence reconstruction and synchronization

Proventas vs. Creek House Seafood and Grill, LLC (STCV19-00197)
Georgia State Court – County of Chatham

Wrongful death case

- Forensic video evidence recovery and authentication
- Forensic video enhancement and analysis
- Super-resolution imaging
- Court exhibit preparation
- Expert witness testimony

State of North Carolina vs. Ramone Alston (COA-19-346)
Court of Appeals of North Carolina
Homicide conviction appeal

- Forensic video and image authentication
- Forensic video and image enhancement
- Forensic video analysis
- Still frame capture

People vs. Daryoush Sameyah (LAC9CJ04260-01)
Superior Court of California - County of Los Angeles
Assault with a deadly weapon

- Forensic audio analysis
- Forensic audio authentication
- Detection of evidence tampering

McCray vs. Alexander Jr. (2018-164)
Circuit Court of the 21st District – Williamson County, TN
Wrongful death case

- Forensic audio analysis
- Forensic image analysis
- Forensic video enhancement
- Court exhibit preparation

- Evans vs. Gorgenkon et al.** (0300631/2017)
Superior Court of New York – County of Bronx
Vehicle accident case
- Forensic video enhancement
 - Forensic video authentication
 - Forensic video analysis
- A.W. vs. Stellar Restaurant Group, Inc.** (2084-CV-00657)
Superior Court of Massachusetts – County of Suffolk
Personal injury case
- Forensic video authentication
 - Forensic video enhancement
 - Forensic video analysis
- Officer-Involved Shooting of Robert Coleman** (DPD-20-03981)
West Sacramento Police Department, California
- Forensic video authentication and analysis
 - Forensic video enhancement and synchronization
 - Video preparation for public release
- State of California vs. Jacob Oehlcke** (CR-2020-4149)
Superior Court of California - County of Yolo
Robbery/Homicide case
- Forensic video analysis and enhancement
 - Court testimony
- Officer-Involved Shooting of Christopher Gray** (WSP-19-07523)
Davis Police Department, California
- Forensic video enhancement and synchronization
 - Forensic video analysis and still frame capture
 - Court exhibit preparation
- State of California vs. Dominique Jackson** (CR-2019-6376)
Superior Court of California - County of Yolo
Sexual assault case
- Forensic video evidence recovery
 - Forensic video authentication and enhancement
 - Forensic video analysis and still frame capture
- State of California vs. Joshua Bolden** (CR-2019-4186)
Superior Court of California - County of Yolo
Armed robbery case
- Forensic video evidence recovery
 - Forensic video authentication and analysis
 - Court testimony

State of California vs. Tuala Auimatagi (CR-2019-4995)
Superior Court of California - County of Yolo
Homicide case involving hundreds of hours of surveillance video

- Forensic video evidence recovery and authentication
- Forensic video enhancement and synchronization
- Forensic video analysis and still frame capture
- Court exhibit preparation and testimony

State of California vs. Steven Ferris (CR-2019-2476)
Superior Court of California - County of Yolo
Robbery case

- Forensic video authentication and enhancement
- Forensic video analysis and still frame capture
- Court testimony

State of California vs. Terrance Ivory (CR-2018-5165)
Superior Court of California - County of Yolo
Child abuse case

- Forensic video authentication
- Forensic video analysis and still frame capture
- Court testimony

State of California vs. Larry Duncan (CR-2018-4948)
Superior Court of California - County of Yolo
Assault with a deadly weapon case

- Forensic video evidence recovery
- Forensic video analysis
- Court testimony

State of California vs. Bryant Coulson (CR-2018-4292)
Superior Court of California - County of Yolo
Burglary case

- Forensic video authentication and analysis
- Still frame capture
- Facial recognition match

PROFESSIONAL AFFILIATIONS

International Association for Identification - Active Member
theiai.org

Audio Engineering Society - Active Member
aes2.org

Electronics Technicians Association International - Active Member
etai.org

PUBLICATIONS, SPEAKING ENGAGEMENTS, & INTERVIEWS

Understanding Video and Audio Forensics November 2022
Presentation, Georgia Association of Professional Private Investigators

Why Security Camera Footage Still Sucks – Cheddar Explains August 2022
Interview, Cheddar News, cheddar.com

Stop posting pictures with your clients or from your security details March 2022
Interview, Athena Worldwide, epbacktobasics.com

Photoshop's Deadly Consequences August 2021
Published Article, eForensics Magazine, ISSN 2300 6986

REFERENCES

References are available on request.