



CSI: El Segundo

For the past few television seasons, network and cable channels have been awash in crime scene investigators and forensic experts solving what seem to be unsolvable crimes. Cutting-edge technologies, some of which have yet to be invented, coupled with keen insight and investigative savvy, usually have the culprit in 'cuffs within 60 minutes—with commercials.

Although forensics-related television programs are in vogue today, the National Institute of Justice's National Law Enforcement and Corrections Technology Center-West (NLECTC-West) in El Segundo, California, has been employing real-world audio, video, and metallurgical forensics analysis in support of more than 1,000 felony investigations since 1994.

Working with a surveillance videotape that is too grainy? Sorting through the background noise of an audiotape to pick out the information you need? Trying to get a few metal fragments to tell you what happened in an accident? NLECTC-West calls on the expertise of its technical host, The Aerospace Corporation, a not-for-profit company that operates a federally funded research and development center for the U.S. Air Force and works with other government agencies and commercial firms. Although the Center has an active outreach program and receives referrals from past users, most of its requests for assistance come by word of mouth.

Working primarily in the areas of video and audio enhancement, the Center's assistance has led to arrests, validated Miranda rights notifications, corroborated witness testimony, and helped investigators develop new leads. In a 2001 investigation by the Los Angeles Police Department of a kidnapping, rape, and robbery, officers were looking for two men who knocked a woman from her bicycle, breaking her leg. The woman was put into a van, raped, and then driven to an automatic teller machine (ATM) where she was forced to withdraw money. The suspects then drove her to the entrance of a hospital emergency room where she was left outside. The suspects fled with some of the woman's personal items, including her house key. They not only went to

her house, but one of them also went back to the hospital and entered her room. Needless to say, police were anxious to track down and arrest the two men. They turned to NLECTC-West for video enhancement assistance in identifying the van used by the two men.

Fortunately for police, images of the van were captured by the ATM's security camera. Although the area around the ATM was not well lit, the van stayed long enough that it appeared in multiple frames. This allowed an analyst to overlap frames, increase the contrast of the pixels, and read six of seven license-plate digits. Within 3 hours of coming up with the partial license number, police arrested one suspect; the other was taken into custody approximately 2 weeks later. One suspect pled guilty; the other was convicted at trial.

NLECTC-West will soon begin offering a course on video forensics in addition to an audio forensics course, which it has offered since 2002. The audio forensics course uses computer software designed for the music industry and specific software filters created for law enforcement to teach investigators the skills needed to perform audio forensic analysis. The 20-hour course teaches digital signal-processing theory and skills, how to evaluate audio cases, and the hardware and software requirements for performing analysis. Students complete workbook exercises and may bring in evidence from a case they currently are investigating.

Graduates of the Center's audio forensic course continue to use Center specialists as mentors and have provided useful recommendations on improving the instruction process and class content. In addition to teaching participants new skills, the course provides an opportunity to network with others in the field. Idaho and Utah have approved the course for Peace Officers Standards and Training (POST) credit, and California and Nevada may approve similar certification soon.

NLECTC-West also handles metallurgy requests, usually in connection with automobile accidents. In one assistance project, the California Highway Patrol (CHP) brought in lug nuts from a truck and a fender from a car

involved in a fatal accident. According to officers, the car had been completely demolished in the accident. However, the car's fender had a dent that appeared to be made by one of the truck's lug nuts. If the dent was determined to be clockwise in nature, that would mean the two vehicles came at each other from different directions. If the dent was counterclockwise, the vehicles were going in the same direction. Witnesses gave conflicting reports of the accident, and the truck driver apparently was not aware of the initial impact.

NLECTC-West forensic experts "sliced and diced" the metals and determined that both vehicles were moving in the same direction at the time of the initial impact. Their investigation additionally revealed that the vehicles were traveling at the same speed. CHP also examined skid marks and other evidence at the scene. Combined with the Center's analysis, CHP determined that the truck initially tapped the car, causing it to lose control and careen in front of the truck. A second impact caused the car to flip over nearby guardrails; the truck

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then flipped over on top of the car. The car's passenger died at the scene; the driver died a short time later. They were recently engaged and lived in the local community.

The truck driver was charged as a result of NLECTC-West's analysis (and subsequent testimony) and CHP reconstruction. For its forensics assistance, NLECTC-West received a rarely given commendation from CHP.

For more information on the audio, video, and metallurgy forensics assistance program at NLECTC-West, call 888-548-1618 or e-mail nlectc@law-west.org.



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