

TEARING OFF THE Mob's Mask

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Using forensic video analysis, Vancouver area officials are prosecuting hockey hooligans who rioted after the local team failed to take the Stanley Cup.

IN THIS YEAR'S STANLEY CUP FINALS, the Vancouver Canucks took the Boston Bruins to seven games then lost four to zip on their home ice. That didn't sit well with many of the local hockey fanatics, and they took out their rage on stores, restaurants, cars, people, and the local police.

The resulting riot injured 140 people and resulted in about \$5 million in damages. It also incensed many of the people of British Columbia, and local police agencies responded with a unique and effective investigation.

It's well known that one of the reasons people wreak havoc during riots is that they believe they are anonymous in the mob and therefore immune to punishment for their acts. The Vancouver

Police Department and surrounding agencies formed the Integrated Riot Investigation Team (IRIT) to find out who participated in the riot and provide prosecutors with the means to punish them for things like firebombing cars and businesses.

The IRIT investigators were faced with a seemingly impossible task. They had too much evidence. The riot was not only covered by the news media, it was videoed by just about anyone in the area who had a cell phone, often by friends of the most active rioters who were acting out for YouTube and Facebook. IRIT investigators asked for that video, and they received thousands and thousands of hours of it.

The IRIT investigators quickly realized that even though the

Vancouver PD has perhaps the world's most sophisticated forensic video lab, this task was beyond their capabilities. The video was in dozens of different formats, dozens of different compression ratios, and used different encoding. Processing it for use by the IRIT investigators would require a monumental effort.

IRIT contacted the Law Enforcement and Emergency Services Video Association (LEVA), and it mobilized its Forensic Video Analysis Response Team. The video was sent to the National Digital Multimedia Evidence Process Lab at the University of Indianapolis. The Response Team included 43 forensic video analysts from numerous countries and 10 IRIT officers. They worked in three shifts, 24 hours per day, seven days a week from Sept. 26 to Oct. 9 to process the evidence using the lab's 20 workstations, an Avid ISIS shared storage solution, and Ocean Systems software such as dTective and Omnivore.

"They were faced with what was most likely the most recorded criminal event in the history of the world," says Grant Fredericks, technical manager for LEVA.

Fredericks also worked the 1994 Stanley Cup riot in Vancouver. But in that incident all of the video evidence was captured on analog tape. "We had hundreds of hours of VHS tape," Fredericks recalls.

This time the forensic video job was much more complex than it was 17 years ago. "Every single person down there had a cell phone and everybody was recording video with them," Fredericks says.

Every minute of the video had to be examined by the forensic analysts and the IRIT investigators to make sure that it did not contain exculpatory evidence that might exonerate a person accused of a criminal act. Before the project was completed, the analysts and investigators had logged more than 4,000 hours of painstaking labor.

"We tagged anyone involved in criminal activity," says Fredericks. "The result was that we tagged 15,000 acts of criminal activity, not 15,000 people but 15,000 acts by multiple persons."

In forensic video terms "tagging" means to find someone on the video and follow his or her actions. The tag is set using metadata that describes the person, the action, the location, the time, and other critical information. Each criminal act—whether it was looting, arson, flipping cars, or assault—was given an event

number. Individuals were identified and tracked by defining physical features or by what they were wearing such as a hockey jersey with a specific design or number.

"We were absolutely amazed by the results," says Fredericks, who is retired from the Vancouver PD. "We processed many, many terabytes of data."

Fredericks says that Ocean Systems' Omnivore software was key to the success of the project. "That tool is magic," he says, explaining that it was used to convert all of the media into one

format of uncompressed video so that it could be used by the IRIT investigators and the prosecutors. "We had hundreds of different sources and in about five or six steps we had to process it into something that the IRIT team could use," he adds. "It was quite a daunting process. There was even one analog video tape that we had to work with."

Fredericks also heaped high praise on the Avid ISIS shared storage solution. "I knew that the magnitude of video files involved in this investigation was overwhelming. With our Avid storage solution, the team was easily able to upload, sort, and distribute the massive amount of video files."

The investigation is still ongoing, but Vancouver PD Chief Jim Chu recently held a press conference to announce that 60 people had been identified as participating in the riots and that 163 charges had been recommended to prosecutors. "These are cases that would not have been possible had we rushed through the investigation," Chu said.

It's expected that hundreds of people will face charges before investigation of the riot is complete. Dozens of people suspected of criminal acts have not been identified by name. But the public is helping IRIT put names to faces. Photos of people who damaged property or assaulted individuals during the riots have been posted on the Vancouver PD's Website, and the calls are coming in.

Chu said the riot project was "the largest investigation in the history of the city" and that approximately \$300,000 has been spent on the video analysis. Asked by one reporter if he thought the investigation was worth all of the effort, Chu responded: "We owed this to the victims and to the outraged people of our community." ☉

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Forensic video analysts used Ocean Systems' software to identify rioting hockey hooligans captured on video.

