

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need:

Reliability of Wireless Video Data Transfer

Describe the need:

Recording systems with capabilities of transferring video data wirelessly may suffer from data loss between what is captured by the camera, what is transmitted, and ultimately what is written to the final storage medium. Affected devices may include body worn cameras, CCTV, drones, and IoT recording devices. Loss of data could potentially result in issues including, but not limited to: dropped video frames, incorrect timing information, visual artifacts, and metadata inaccuracies. Research is necessary to better understand how different factors affect data loss, the impacts of data loss on the resulting video recorded from these systems, and the reliability of the resulting video when used for forensic analysis.

Keyword(s):

Wireless, Video, Transmission, CCTV, Digital Video Recorder, Reliability, Forensic Video, Multimedia, Body Worn Cameras, IoT devices

Submitting subcommittee(s):

VITAL

Date Approved:

28 June 2023

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

There has been some research into the reliability of recording devices, in general, but the specific implications of wireless video transmission systems have not been the focus of much research to date. Studying and verifying data transmission loss in wireless recording systems will bring awareness to and determine limitations of wireless recording devices.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

The video task group is not aware of any scientific studies, published or in progress, which discuss data loss of wireless recording systems and the forensic impact of such loss.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

Chen, Min, et al. "Enabling low bit-rate and reliable video surveillance over practical wireless sensor network." The Journal of Supercomputing 65.1 (2013): 287-300.

Alsmirat, Mohammad A., et al. "Internet of surveillance: a cloud supported large-scale wireless surveillance system." The Journal of Supercomputing 73.3 (2017): 973-992.

Porter, Glenn. The reliability of CCTV images as forensic evidence. Diss. University of Western Sydney (Australia), 2011.

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

Not at the above listed site.

5. In what ways would the research results improve current laboratory capabilities?

This would provide understanding of the wireless recording systems and the effects on subsequent examination of the video recorded.

6. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Current scientific literature does not reflect the diverse factors that affect the amount and significance of data loss during the wireless transmission of video data. It is understood that factors such as the distance from the camera to the receiver, objects obscuring the data transfer signal path, video resolution, workload of the recording system, bit rate of the recorded data, varying optimization technology used for the data transmission by the recording system, and the available bandwidth for data transfer can impact data loss; however, the amount of data loss and the significance of the data loss has not been researched. Understanding the effects of the data loss on wirelessly transmitted video would assist with establishing standards and/or guidelines for the analysis of video captured with a wireless recording system.

7. In what ways would the research results improve services to the criminal justice system?

This research would help forensic video practitioners understand the limitations of video recorded from wireless recording devices and understand the reliability of the video when subjected to a forensic analysis.

8. Status assessment (I, II, III, or IV):

III

--	--

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.