Disruption-free videos

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Standardized video coding techniques still have their snags -- digitally transmitted images are not always disruption-free. An extension of the H.264/AVC coding format allows to protect the most important data packets to ensure they arrive safely at the receiver.

Your favorite detective series has just reached its most exciting moment when it happens: The thunderstorm raging outside interferes with the digital image on your TV. The picture keeps getting stuck – and the murderer goes undetected. The reason for such interferences is that crystal-clear image quality, such as in HDTV, involves an increased volume of data.

But the data packets are at risk during transmission, as information can be lost along the way. This poses a serious problem for developers of video coding techniques. Once the data packets are lost, it is very difficult to correct the error. Researchers at the Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institut, HHI in Berlin are therefore working to improve standardized video coding techniques such as the H.264/AVC format, which is used by the YouTube video portal and Apple's QuickTime player, for example. If an Internet node is overloaded, for instance, data packets are randomly discarded during transmission. This causes a jerky picture.

"Our extension of the H.264/AVC coding format protects the most important parts of the data packets so that they can be broadcast without error," says Dr. Thomas Wiegand, head of department at the HHI and a professor at the Berlin Institute of Technology. The data packets in

question are precisely those required for a disruption-free video. The researchers use additional data to protect them. "If, say, two video packets need to be transmitted, we equip an additional data packet with the result of the sum of the bytes in the two video data packets. If any of these three data packets gets lost, we can deduce the content of the original two," explains Wiegand. The new coding format makes it possible to restrict these additional data packets to the most important part of the video. In this way, if anything does get lost, only the quality will fluctuate.

The extension of the H.264/AVC format is called SVC (scalable video coding). It runs on all H.264/AVC-compatible devices, so customers do not need to buy new ones. Moreover, it works independently of the overall data volume and can ensure fault-free reception even for high-resolution TV. SVC standardization has now been completed and will come into use in various applications: for HDTV, the Internet, video conferences, surveillance technology or mobile radio. The researchers will present the new extended format at the IBC conference in Amsterdam on September 12 through 16.

Source: Fraunhofer-Gesellschaft