

Visibility of spatiotemporal noise in digital video

Abstract:

Tests have shown that video quality is still difficult to reflect with automatic quality metrics. To improve the automatic evaluation of quality, including human perception seems prospective. A vast amount of perception research has been conducted in vision science. However, the quality metrics used in image and video processing research do not – or not sufficiently – integrate our knowledge about human perception. In this talk, we will specifically discuss the visibility of one image degradation type, spatiotemporal noise, which occurs in digital video especially in low light situations.

After a short introduction of ARRI and the relevant applications, this talk will specifically address the issue of noise in digital video, which can clearly reduce the perceived quality. As no experimental study could be found about the visibility of noise, two experiments were conducted aiming to investigate the visibility of spatiotemporal noise.

The experiments subsequently evaluate the visibility of noise in different spatial and different temporal frequencies on a monitor. Eight spatial frequencies are investigated and two different video frame rates, 24 fps and 48 fps. The experiment setup and the results will be discussed in detail. The talk concludes with an outlook on future research projects and an open discussion about the open questions in vision research.