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SERIES P: TELEPHONE TRANSMISSION QUALITY

Audiovisual quality in multimedia services

**Principles of a reference impairment system for
video**

ITU-T Recommendation P.930

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION P.930**PRINCIPLES OF A REFERENCE IMPAIRMENT SYSTEM FOR VIDEO****Summary**

This Recommendation describes the principles of an adjustable video reference system that can be used to generate the reference conditions necessary to characterize the subjective picture quality of video produced by compressed digital video systems. A Reference Impairment System for Video (RISV) can be utilized to simulate the impairments resulting from the compression of video sequences, independent of compression scheme. The subjective evaluation methods are described in Recommendation P.910.

Appendix I describes VIRIS (a Video Reference Impairment System developed by Bellcore), which is a specific implementation of an adjustable reference impairment system for video. Although the studies done at Bellcore were with MPEG-1, VIRIS can also be used with other compression schemes, such as H.261.

It is recommended that a RISV be capable of producing the following categories of distortions, either singly or in combinations, with independent adjustment of each impairment level:

- a) Artifacts due to conversions between analog and digital formats (e. g. noise and blurring).
- b) Artifacts due to coding and compression (e. g. jerkiness, edge busyness, and block distortion).
- c) Artifacts due to transmission channel errors (e. g. errored blocks).

In this Recommendation, five types of impairments (block distortion, blurring, edge busyness, noise, and jerkiness) are defined and general methods for implementing these impairments are provided. Appendix I describes a specific implementation of these impairments in VIRIS. Other impairments are the subject for future study.

From the viewer's point of view, the impairments produced by the RISV should be a good approximation of impairments generated by digital video coding and transmission systems.

Three possible applications for the RISV are:

- 1) creating reference conditions in subjective tests of digital video systems to ensure that the quality of the scenes presented to viewers covers the entire range of picture quality;
- 2) defining standard video impairment levels that can be used to compare subjective test results; and
- 3) quantifying the user-perceived quality of a video system with respect to a known reference.

Although this Recommendation describes the principles of an RISV, before an implementation can be recommended, validation tests are required.

Source

ITU-T Recommendation P.930 was prepared by ITU-T Study Group 12 (1993-1996) and was approved under the WTSC Resolution No. 1 procedure on the 30th of August 1996.