CLOSED−LOOP VIDEO PROCESSING FOR OBJECTIVE QUALITY OPTIMIZATION (WedAmOR5)

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Abstract :

Based on the use of no−reference quality metrics, video chain optimization practices, and video processing requirements, in this paper we formulate and discuss the principles of closed−loop video processing for picture quality optimization. No−reference quality metrics allow monitoring and control video processing that precludes the use of full−reference metrics, e.g. sharpness and contrast enhancement, and format conversion. Most no−reference metrics are based on a set of sub−metrics related to key quality factors, i.e. the minimum set of desirable and undesirable picture attributes. The video processing chain of consumer systems usually integrates a dozen or more algorithms which are designed mainly independent of each other. The video chain is mainly an open loop system, where the best operating point is chosen experimentally and then left untouched or just slightly customized. In order to turn a video processing chain or pipeline into a closed−loop video processing system, we discuss the quality requirements of consumer video systems, the type of no−reference metrics suitable for a control system, and the control principles which will allow implementation of future generations of closed−loop video processing systems.

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