RATE−DISTORTION OPTIMIZED BANDWIDTH ADAPTATION FOR DISTRIBUTED MEDIA DELIVERY (ThuPmSS1)

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Abstract :
We propose a framework for rate−distortion optimized bandwidth adaptation via packet dropping at a network node, when the incoming traffic at the node consists of multiple video streams. The framework enables the node to decide in a rate−distortion optimal sense, which packets, if any, from each stream should be discarded in order to adapt to the available outgoing bandwidth at the node, so that the overall video quality over all streams is maximized. The framework relies on a rate−distortion hint track information that is sent along with each video packet. The hint track information consists of two quantities: the size of the video packet in bits, and its importance for the reconstruction quality of the video stream. Experimental results demonstrate that our framework provides significant gains in video quality, both over all streams jointly and also over the individual videos, relative to a conventional system for bandwidth adaptation that does not take into account the different importance of the individual video packets.