Format-Compliant Selective Scrambling for Multimedia Access Control  
(abstract only)  

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Abstract  

We present a framework for access control of standard-compliant compressed video and audio bitstreams for entertainment purposes. This includes format compliant selective encryption and compliance-preserving secure spatial shuffling. The approach leverages well-known encryption algorithms, has low complexity, and maintains standard-compliance of the encrypted bitstream. The standard compliance feature guarantees the inheritance of many error resiliency properties of the video and audio compression standards, and works with many existing network bandwidth adaptation and error control techniques that have been developed for standard-compliant compressed video/audio, thus making it especially suitable for Internet commerce and wireless multimedia applications. Standard compliance also allows subsequent signal processing techniques to be applied to the encrypted bitstream. The approach is also capable of providing layered tradeoffs between security, complexity, delay, bit overhead, etc. We will demonstrate the effectiveness of the proposed framework by applying it to MPEG-4 video bitstreams and MPEG-4 AAC audio bitstreams. The proposed framework has been recently adopted into MPEG-4 IPMP (Intellectual Property Management and Protection) extension Committee Draft.