

Joint Power/Playout Control Schemes for Media Streaming over Wireless Links

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We investigate transmission and playout policies for streaming media over a wireless link. In particular, we choose both the power at the transmitter and the playout rate at the receiver, in order to minimize the power consumption and maximize the media quality. We formulate the problem using a dynamic programming approach, study the structural properties of the optimal solution, develop justified heuristics, and demonstrate significant performance gain over benchmark systems. In particular, we develop a low-complexity, practical joint power-playout heuristic that outperforms (1) the optimal power control policy in the regime where power is most important, and (2) the optimal playout control policy in the regime where media quality (playout) is most important; furthermore, this heuristic has only a slight performance loss as compared to the optimal joint power-playout control policy over the entire range of investigation.