

MASTER'S THESIS

The design and implementation of a MPEG video system with transmission control and QoS support

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The Design and Implementation of a MPEG Video System
with Transmission Control and QoS Support

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Master of Philosophy

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Abstract

With the advance in computer and network technologies, the interaction and delivery of multimedia data through the Internet by the broadband network becomes popular. A variety of multimedia systems and Internet applications have been emerging, fulfilling the ever increasing demand on the Internet streaming applications. From this motivation, we designed and developed a distributed real-time MPEG video system with a feedback transmission control and a QoS control based on human perspective. The system aims at providing the best QoS for both audio and video streams to the clients under an uncontrollable open network. The transmission control and QoS control try to provide a more adaptive strategy to cope with the changes of the environment for the system. For the transmission control scheme, it regulates the flow of video data. The transmission sequences are prioritized based on the urgency of the frames and the nature of the MPEG-1 video. The transmission control scheme is designed such that real-time data bears the highest priority and non-real-time data has the lowest priority. Moreover, the QoS control mechanism makes use of the client's buffer to handle the network delay and network jitter. The QoS controller closely monitors the status of both clients and the open network. Each video stream is transmitted at the most suitable transmission rate by means of adjusting the feeding pattern within a GOP. A series of experiments is performed to evaluate that the system is able to manage multiple video transmissions over an uncontrollable network effectively and efficiently. In fact, it also shows that the system can adapt to the dynamic changes in network conditions and can maintain the QoS for every client.

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