

# **JOINT SOURCE CHANNEL CODING OF SCALABLE VIDEO**

by

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## ABSTRACT

Over the last decade, the rapid growth in technology and the advancement in network infrastructures have created a huge demand for multimedia services. Scalable media formats that are highly reliable and flexible have enabled the use of a wide variety of applications for transmission over the Internet. Streaming of multimedia to diverse users is a challenging problem that can be addressed using scalable media and robust error-correction techniques.

This thesis provides an efficient solution for real-time streaming of video to users with different media preferences and varying channel conditions. We approach the problem using *joint source channel coding* (JSCC) where the source and the channel are jointly coded based on user requirements and the available channel resources. The use of *fine-grain adaptive* FEC (FGA-FEC) with a *scalable video coder* (SVC) is presented for reliable transmission of video over heterogeneous networks. Our implementation enables near optimal adaptation of scalable video partially eliminating the need for transcoding at intermediate nodes in the network. The embedded bitstream can be precisely adapted to satisfy diverse users simultaneously with a highly reliable quality of service. We demonstrate the use of our proposed scheme for multipoint videoconferencing that offers extremely low end-to-end delay, high scalability and reliability.