

# FAST AND ADAPTIVE H.264/AVC VIDEO CODING FOR NETWORK BASED APPLICATIONS

Li Liu

Dr. Xinhua Zhuang, Dissertation Supervisor

## ABSTRACT

As the state of the art video coding standard, H.264/AVC achieves significant coding performance gain comparing to its predecessors. Nevertheless, the advance comes at huge complexity increase of the encoder, which may hinder its applications to real world. In addition, network applications impose some unique requirements on existing video coding algorithms. For instance, a variable bit rate output of the encoder has to be tuned into a constant rate bit stream to fit transmission channel bandwidth.

In this dissertation, two issues related to H.264/AVC video coding are to be addressed: coding complexity and bandwidth adaption (rate control), and corresponding solutions are provided. To reduce the coding complexity, the original mode decision process in H.264/AVC reference software is optimized for fast implementation. Moreover, two rate control algorithms are given to address different requirements of rate control: quality fluctuation reduction and accurate basic unit quantization decision.

Experiments are performed to test and validate the proposed algorithms. The results show that the proposed algorithms provide efficient solutions to the above problems and facilitate H.264/AVC coding standard for practical deployment.