



## Study project (equiv. "Studienarbeit")

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<b>Title</b>	Study Project in Multimedia Database Systems
<b>Subject</b>	Design and Implementation of an advanced ratecontrol algorithm for MPEG based real-time video encoding.
<b>Background</b>	<p>Multimedia databases are designed to store and handle large MOs. AV streams are a typical representative, but they can have many formats. In order to provide data independence between stored format and client-side desired format a conversion process has to be done. Since the network connection between client and server is bandwidth limited the conversion step has to be done rate-controlled, this means that the newly generated video stream should not exceed a specific size per time to guarantee smooth playback without delays on the client side. It is obvious that such a ratecontrol algorithm has great influence on the visual quality of the streamed video. Most common algorithms control the bitrate of a video stream by simply varying quantizer values on a per frame level. The goal of this study should be to design and implement an advanced ratecontrol algorithm that makes use of client buffering, adaptive quantisation by varying the quantizer step-size on macroblock level while exploiting human visual perception.</p> <p>This study project could be helpful for the RETAVIC project (<a href="http://www6.informatik.uni-erlangen.de/retavic/">http://www6.informatik.uni-erlangen.de/retavic/</a>)</p>
<b>Task</b>	At first one should analyse and understand the principles of MPEG based video encoding. Since the XVID MPEG-4 video codec ( <a href="http://www.xvid.org">http://www.xvid.org</a> ) should be the code base for our ratecontrol implementation, a clear understanding of the MPEG-4 standard is of great importance. Furthermore studies on how the human visual system (HVS) could be exploited for digital image processing will be required.
<b>Requirements</b>	<ul style="list-style-type: none"><li>- good knowledge of English</li><li>- interest in multimedia area, especially in audio-video conversion</li><li>- good knowledge of "C" programming language</li></ul>
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