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Abstract
With the flourishing development in multimedia technology and Internet, the application of multimedia is very popular. Due to the demand of transmitting and storing large image data, high-performance video compression techniques play important and inevitable roles in image processing. A new video compression standard, H.264, was proposed after the reveals of MPEG-1, MPEG-2 and MPEG-4 standards. It has the property of high compressing rate than MPEG-4, and has recently become a major role in multimedia field.
The complexity of H.264 decoder is very huge. If the implementation of the decoder uses hardware design style, the cost is high. Also the flexibility of hardware design style is low. However, the performance is very low when the decoder is implemented by using software (C language) design style. In this thesis we discuss the design methodology of software acceleration for implementing H.264 decoder on an embedded system. In H.264 decoder the computation of IDCT part and memory is large. Instead of using C codes to implement the IDCT part and memory of the decoder, we use the assembly language to carry out the operation. We use the multimedia instruction (the wireless MMX instructions) proposed by the system to improve the performance of the decoder. The new decoder is run on the embedded system using WinCE operation. The experimental results show that the performance of our software acceleration method for designing the decoder improves 16.76% as compared to the design by using C language.
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