Abstract

Hardware video accelerators are used on mobile devices to provide support for energy efficient real time High definition (HD) video decoding. Recently, the rise of multi-core architectures on those devices increased their performances and make real time HD video decoding possible using parallel processing on the GPP cores only. What is even more interesting to know is the level of energy efficiency these kind of multi-core General Purpuse Processor (GPP) can achieve as compared to hardware video accelerators. In this paper, we propose an experimental evaluation of the energy efficiency of the two video decoding approaches. An accurate energy measurement was achieved on a recent low-power 40 nm mobile SoC containing a quad-core ARM processors and a video hardware accelerator. The results show that parallel multi-core HD decoding enhances both the performance and the energy efficiency as compared to the use of a single core. However, the hardware accelerated decoding is about three times more energy efficient. Based on the experimental observations, some challenges for enhancing parallel multi-core video decoding energy efficiency are pointed out