conferenceseries.com

2nd Global Summit and Expo on **Multimedia & Applications** August 15-16, 2016 London, UK

Fast motion estimation for HEVC on graphics processing unit (GPU)

Dongkyu Lee Kwangwoon University, Korea

The recent video compression standard, HEVC (high efficiency video coding), will most likely be used in various applications in the near future. However, the encoding process is far too slow for real-time applications. At the same time, computing capabilities of GPUs (graphics processing units) have become more powerful in these days. In this talk, we present a GPU-based parallel motion estimation (ME) algorithm to enhance the performance of an HEVC encoder. A frame is partitioned into two subframes for pipelined execution to improve GPU utilization. The flow chart is redetermined to solve data hazards in the pipelined execution. Two new methods are introduced in the proposed ME: decision of a representative search center position (RSCP) and warp-based concurrent parallel reduction (WCPR). A RSCP employs motion vectors of a co-located CTU (coding tree unit) in a previously encoded frame to solve a dependency problem in parallel computation with negligible coding loss. WCPR concurrently executes several parallel reduction operations, which increases the thread utilization from 20 to 89% without any thread synchronization. The proposed encoder can make the portion of ME in the encoder negligible with 2.2% bitrate increase against the HEVC test model (HM) encoder. In terms of ME, the proposed ME is 130.7 times faster than that of the HM encoder.

Biography

Dongkyu Lee received his BS and MS degrees in Electronic Engineering from Kwangwoon University, Seoul, Korea, in 2012 and 2014, respectively. He is a PhD candidate at the Kwangwoon University. His research interests are image and video processing, video compression, and video coding.

dongkyu@media.kw.ac.kr

Notes: