An Adaptive Multialphabet Arithmetic Coding Based on Generalized Virtual Sliding Window

We propose a novel efficient multialphabet multiplication-free adaptive arithmetic coder. First, we generalize probability estimation via virtual sliding window for the multialphabet case and show that it does not require multiplications and provides a tradeoff between the probability adaptation speed and the precision of the probability estimation. Second, we show how the generalized virtual sliding window can be used to eliminate multiplications and divisions. Finally, we demonstrate that the proposed arithmetic coder provides better compression performance than existing implementations based on state-of-the-art multiplication-free binary arithmetic coders.