# Video coding based on three-dimensional discrete pseudo cosine transform

**Eugeniy Belyaev**

Saint-Petersburg Institute for Informatics and Automation of the RAS

Russia

Email: e_beliaev@mail.ru

## Abstract

One of the top tasks for video streaming, video surveillance, video conferencing and video broadcasting is a low bit rate and real-time video coding. The most popular low bit rate video compression approach is based on the H.264/AVC standard [1]. This standard provides high compression efficiency due to hybrid video coding which includes intra-frame prediction, variable-size block motion estimation and compensation, variable-size transform, high efficiency entropy coding etc.

As an alternative, this presentation describes a low bit rate video coding approach based on three-dimensional discrete pseudo cosine transform (3-D DPCT) [2]. This approach uses faster arithmetic coder implementation than H.264/AVC, does not use motion estimation for exploiting video source temporal redundancy and as well as H.264/AVC uses multiplication-free transform and division-free quantization. From this it follows that 3-D DPCT codec has lower computational complexity than main profile of H.264/AVC standard. At the same time it has high compression efficiency at low bit rates. Therefore, proposed video coding algorithm can be attractive for low bit rate video communication.

In addition video source rate control based on adaptive Lagrange multiplier selection is introduced [3]. Practical results which show the compression efficiency of the proposed algorithm in comparison with H.264/AVC standard and its scalable (SVC) extension are presented.

## REFERENCES

[1] Advanced video coding for generic audiovisual services, *ITU-T Recommendation H.264 and ISO/IEC 14496-10 (AVC)*, 2009.

[2] E.Belyaev, T.Sukhov and Kai Liu, Scalable video coding based on three-dimensional discrete pseudo cosine transform *The 10th International Conference on Next Generation Wired/Wireless Advanced Networking*, 2010.

[3] E.Belyaev, Low bit rate video coding based on three-dimensional discrete pseudo cosine transform *International Conference on Ultra Modern Telecommunications*, 2010.