CCITT SGXV
Working Party XV/1
Experts Group for ATM Video Coding

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SOURCE : Norway
TITLE : Summary Description of VADIS/COST Algorithm Group 2 Forward Prediction Method
PURPOSE : Information

Introduction

This document is a short summary of the VADIS/COST Algorithm Group 2 Forward Prediction Method. It is based on the aspects presented in document AVC-30, "Improvements of hybrid DCT coding", at the Paris meeting. The document lists/describes parts of the proposed algorithm which we mean contributes to the good subjective quality demonstrated earlier.

The starting point is a hybrid DCT scheme. Among the features which makes the algorithm diverge from SM* and RM* are:

- multiple two-dimensional VLC's for coefficient coding
- prediction from two frames as alternative to interpolative coding

Emphasis has been on making the algorithm simple and "clean" in its structure, while keeping a high coding efficiency. Keeping the delay down has also been a major goal.

Multiple two-dimensional VLC's for coefficient coding

The efficiency of the VLC depends on the statistics of the data to be coded. The most critical part of a VLC is that the codeword for the most probable outcome is well adjusted to the statistics. The most probable outcome is usually EOB. It is therefore important always to assign the correct number of bits to EOB.

In this algorithm three different two-dimensional VLC tables are defined. They use 1-3 bits for EOB. For every coefficient to be coded, one of the three VLC's is chosen. The decision is based on parameters known to the encoder and decoder so no side information is necessary. This gives a local adaption of VLC for the transform coefficients.

This methods makes the coding very adaptive to:

- source data
- quantizer/bitrate
- luminance/chrominance coding

Dual frame prediction

Only forward prediction is used. The prediction may be from either of the two preceding frames using 1/2 pixel motion estimation.

Only two types of frames are used: Intra and Predicted.

Advantages of the method:

Delay:

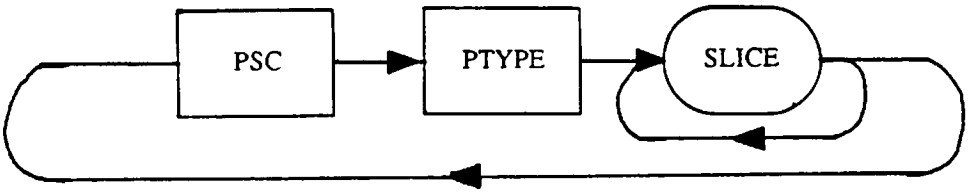
The method may give coding delay down to 150 ms due to forward prediction only. For conversational services, the regular INTRA coding may be dropped and the delay reduced to well below 150 ms.

Simple architecture:

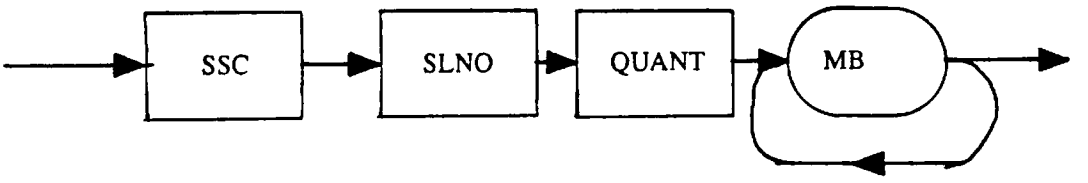
- There is only predicted frames which are all treated the same.
- There is only one motion vector pr. macroblock
- There are only few macroblock types, and they are the same for every frame

SYNTAX:

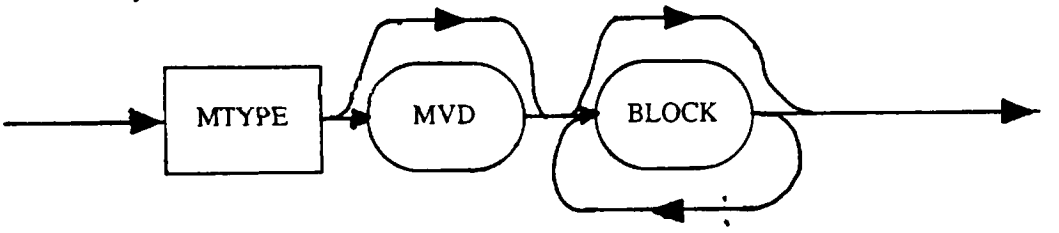
PICTURE layer:



SLICE layer:



MB layer:



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