CCITT
Question 4/XV
Specialist group on
coding for visual telephony

S/19/HP/7

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Source : France, Sweden, The Netherlands

Title : Basics of coding Algorithm

Due to the necessity of making a decision very soon, we have given up pure V.Q. schemes, and focused our attention on hybrid DPCM/Transform coding scheme according to figure 1. The coding scheme utilizes a block transform. The predictor may incorporate movement compensation at the encoder but it is compulsory at the decoder.

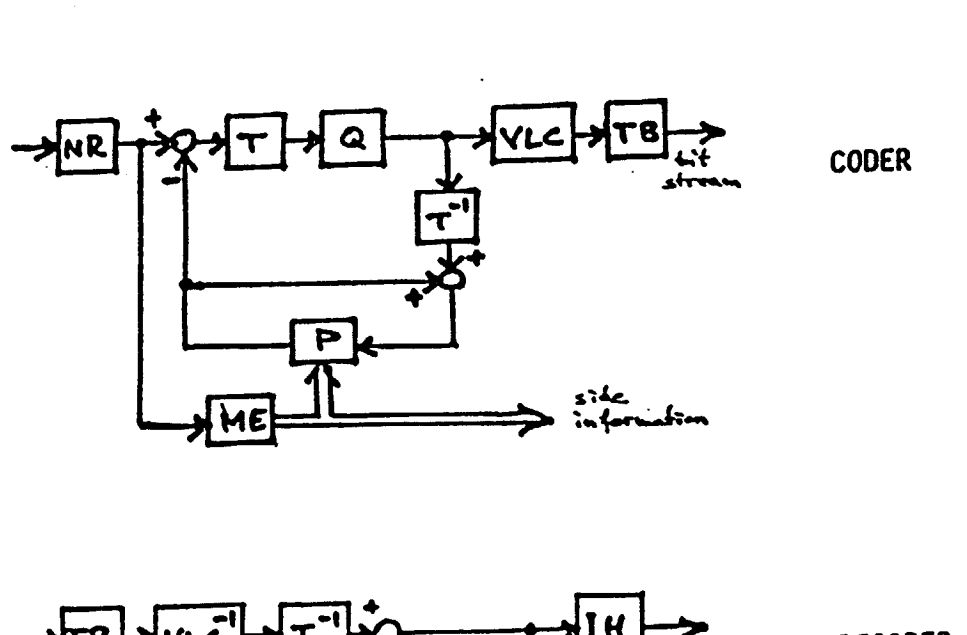

Figure 1

Picture format

Pictures are coded in component form, these components being luminance (Y) and two colour difference signals (R-Y et B-Y). There are 360 luminance pels per line with an orthogonal sampling pattern. The colour difference sampling parameters are 180 samples per line, 144 lines, orthogonal. Both R-Y and B-Y samples are sited such that their block boundaries coincide with luminance block boundaries.

P - Predictor

The predictor is suggested to work in three different modes :

- intra-frame
- inter-frame
- motion compensated inter-frame.

The decision concerning which predictor to use inter/inter MC/ intra) can be made before or after coding.

ME - Motion estimation

Motion estimation is optional at the coder. The decoder will accept one displacement vector for each luminance block of size m pels by n lines. The maximum displacement vector is +/- 16 pels and +/- 16 lines. Only integer values of the horizontal and vertical components of the vector are permitted. (Note : the encoding method for transmission of displacement vectors may restrict the vectors to a subset of these 1089 possible values that the decoder hardware can accomodate).

The displacement vectors are transmitted by side information.

A positive value of the horizontal component of the displacement vector signifies that the prediction is formed from pels in the previous picture which are spatially to the right of the pels being predicted.

A positive value of the vertical component of the displacement vector signifies that the prediction is formed from pels in the previous picture which are spatially bellow the pels being predicted.

T - Transform

The picture, or the resulting difference picture, after prediction, is subdivided into blocks which are then coded by a 2-dimensional transform based scheme. Coding block size for luminance is i x j sample values. Block size is left open for the moment.

The transform will be define later and is then envisaged on a matrix multiplication basis.

Q - Quantizer

The number of quantisers provided at the decoder will be 32. Each quantiser has 12 bits input and up to 16 bits out.
(The same or different for luminance/chrominance ?
Adaptive/non-adaptive).

The quantization strategy in left open for the moment.