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CODED REPRESENTATION OF PICTURE AND AUDIO INFORMATION

ISO-IEC/JTC1/SC29/WG11
MPEG 92/.....

Title: **Compatible Coding Structure**
Source: **PTT Research**
Purpose: **Proposal for Test Model**
Groups: **Video, Requirements**

Introduction

Compatibility is an important requirement for MPEG and the CCITT Experts group. In the Preliminary Working Draft (MPEG92/086) some elements are already included to facilitate this. However several items are missing, such as a coding structure, and needs to be included.

In this document a proposal is made for a compatible coding structure for the Test Model, which might form a basis for future work. The coding structure does not require modifications in the syntax of the PWD and the non-compatible coding structure outlined in the PWD.

Principle

The encoder system consists of two loops, an upper loop processing the high resolution image, and a lower loop processing the compatible image. The error signal in the upper loop is predicted by the coded error signal in the compatible loop. The prediction of the error signal is made in the pixel domain. A linear interpolation inside a block is proposed for the up-sampling filter.

Outline of the coding structure

The encoding structure as depicted in figure 1, shows two loops. The upper loop will process the high resolution input signal. The high resolution input signal is down-sampled to the compatible resolution. This signal is coded by an MPEG1 or H.261 encoder, the coded difference signal is up-sampled to the corresponding high resolution. This up-sampled difference signal is used to predict the high resolution difference signal.

The decoder structure as depicted in figure 2, show a single loop. The compatible signal is inputed on 1, the high resolution signal is inputed on 2. Both signals are inverse quantized and then transformed

by the IDCT . The compatible transformed signal is up-sampled and added to the corresponding high resolution signal. The sum of these signals is inputed into the decoder loop.

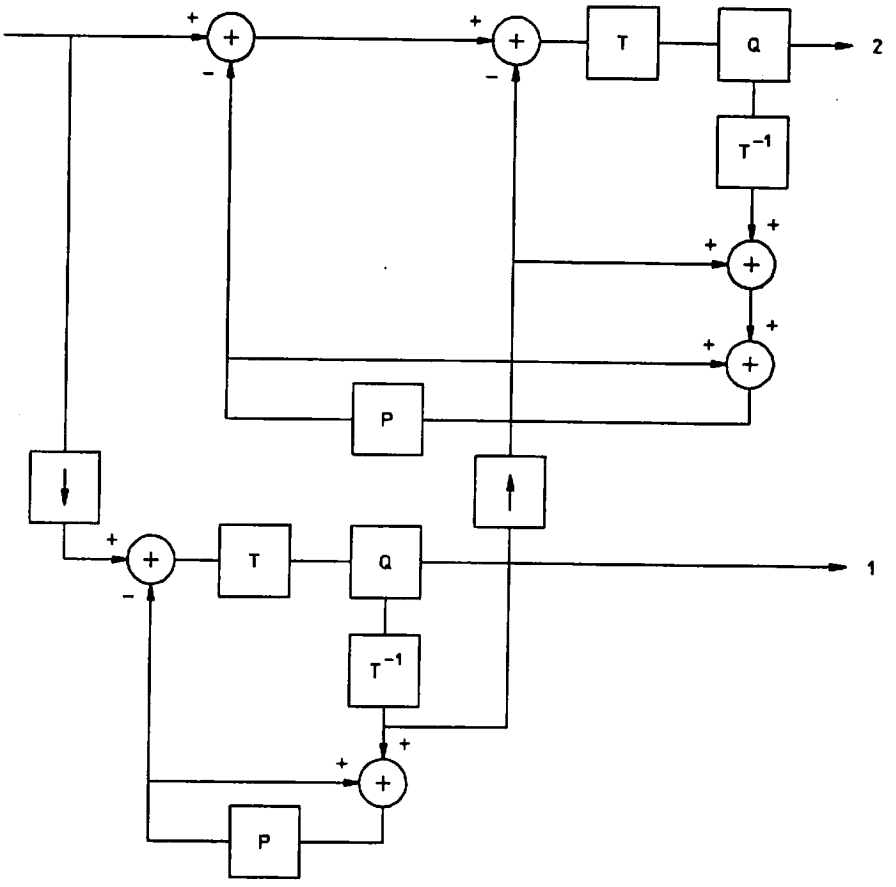

Figure 1: Compatible encoder structure

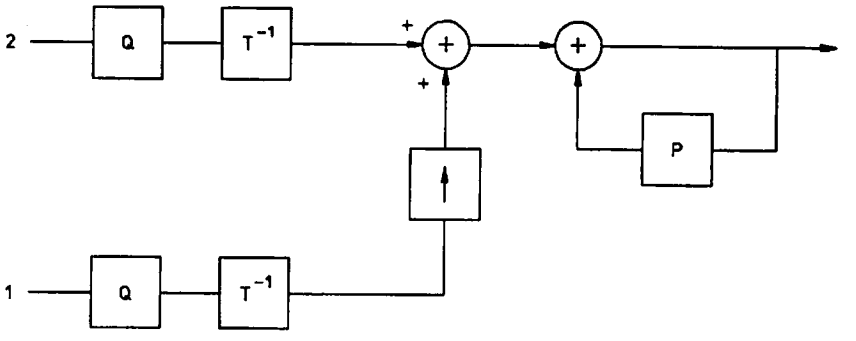

Figure 2: Compatible decoder structure

An MPEG1 or H.261 can be derived from the bitstream. The MPEG1 or H.261 decoders are not depicted.

Up-sampling

Only a limited number of interpolation filters can be implemented in a real system. It is proposed to use only 1:2 or 1:1 (no interpolation) interpolation filters in horizontal and vertical direction. The following 3 tap filter interpolation filter is used for the 2:1 up-sampling in one of the spatial directions:

[1, 2, 1] / 2

Conclusion

A proposal for the inclusion of a Compatible Coding Structure in the Test Model is made. This coding structure is a proper basis for future studies.