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**Datasheet for the decision
of 30 October 2006**

Case Number: T 1013/03 - 3.5.01

Application Number: 97309715.7

Publication Number: 0863671

IPC: H04N 7/26

Language of the proceedings: EN

Title of invention:

Object-oriented adaptive prefilter for low bit-rate video systems

Applicants:

LUCENT TECHNOLOGIES INC., et al

Opponent:

-

Headword:

Object-oriented prefilter/LUCENT TECHNOLOGIES

Relevant legal provisions:

EPC Art. 54, 84

Keyword:

"Clarity (yes)"

"Novelty (yes)"

Decisions cited:

-

Catchword:

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Case Number: T 1013/03 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 30 October 2006

Appellants:

LUCENT TECHNOLOGIES INC.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 26 May 2003
refusing European application No. 97309715.7
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. Steinbrener
Members: R. Zimmermann
G. Weiss

Summary of Facts and Submissions

- I. European patent application number 97 309 715.7, filed on 2 December 1997 and claiming a priority date from December 1996, concerns an object-oriented adaptive prefilter for low bit-rate video systems.
- II. The examining division made objections to the application, based on lack of clarity in the definition of an "extractor" in claim 1 and on lack of novelty of the claimed invention in the light of the prior art document US-A-5 491 514 (document D1, published in February 1996).

In response to the objections, the applicants filed amended claims by a letter dated 9 May 2002, independent claims 1 and 12 reading as follows:

Claim 1:

"A prefilter apparatus for filtering a video signal prior to video coding, the apparatus comprising:
a first connector adapted to receive an input video signal;
an image parameter extractor (50) which analyzes the video signal and identifies pixels in the video signal that are associated with at least two predetermined image parameters, wherein the number of pixels associated with one of the image parameters is less than the total number of pixels in the video signal;
a selector (90) which assigns a first predetermined factor to the pixels associated with at least one of the predetermined image parameters;

a filter (95) which filters the video signal, wherein the filter strength applied to the pixels that are assigned the first predetermined factor is different from the filter strength applied to at least one other pixel in the video signal; and
a second connector adapted to transmit the filtered video signal to a video coder."

Claim 12:

"A method of prefiltering a video signal prior to video coding, the method comprising the steps of:
receiving an input video signal;
analyzing the video signal to identify pixels in the video signal that are associated with at least two predetermined image parameters, wherein the number of pixels associated with one of the image parameters is less than the total number of pixels in the video signal;
assigning a first predetermined factor to the pixels associated with at least one of the predetermined image parameters;
filtering the video signal, wherein the filter strength applied to the pixels that are assigned the first predetermined factor is different from the filter strength applied to at least one other pixel in the video signal; and
transmitting the filtered video signal to a video coder."

The examining division refused the application for lack of clarity in claim 1 and lack of novelty in claims 1 and 12. According to the written decision, dated 26 May 2003, the definition of an "image parameter extractor"

in claim 1 led to the assumption that image parameters were extracted, which was not the case, however. It was not clear what was extracted if not image parameters. For assessing novelty of the subject-matter of claim 1, the examining division interpreted the "extractor" as "means for analysing and identifying".

Lack of novelty resulted from document D1, figure 14 with columns 18 and 19, which fully anticipated the claimed invention; it disclosed connectors for receiving and transmitting video signals, means for analysing the video signal and identifying pixels in the video signal that are associated with at least two predetermined image parameters, a selector and a filter, all components as defined in claim 1. The filter was a prefilter in terms of the claims since it was located before the video coder.

III. The applicants (appellants) lodged an appeal against the refusal decision of the examining division. The notice of appeal, including a debit order in respect of the appeal fee, was filed on 4 July 2003. On 9 September 2003, the appellants filed a written statement setting out the grounds of appeal and two sets of amended claims marked Alternative A and Alternative B.

The appellants requested, as main request ("first request"), grant of a patent based on the claims forming the basis of the decision under appeal with the proviso that in claim 1 the expression "an image parameter extractor" (50) which" be replaced by " a means for analyzing and identifying (50), said means", as "first alternative request", grant of a patent based

on the set of claims marked "ALTERNATIVE A", and, as "second alternative request", grant of a patent based on the set of claims marked "ALTERNATIVE B".

According to the appellants, document D1 described an emphasis circuit in a coding apparatus cooperating with a complementary de-emphasis circuit in a decoding apparatus for the purpose of reducing coding noise resulting from the compression and coding of video signals. It had nothing to do with filtering out unwanted frequencies where the unwanted frequencies vary depending on the image parameters associated with pixels. In contrast, the invention recognized important regions of an image depending on the type of scene, such as facial regions within a portrait scene or foreground aspects contained within a panoramic scene, for example. Assuming, for example, that something in the background of an image, such as the individual slats of Venetian blinds fluttering in a breeze, moved at nearly the same frequency as a speaker's lips, the invention would filter the blind movements very differently as distinguished from the coding apparatus of document D1 filtering both the lips and the fluttering blinds in the same way if the respective amplitudes of the video signal were the same.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC and is thus admissible.

2. Moreover, the appeal is already allowable on the basis of the appellants' main request since the reasons given for the refusal do not stand up to close scrutiny.

Clarity

3. First, the term "extractor" or "image parameter extractor" in claim 1 has now been replaced by a term which the examining division itself used for interpreting the claim, namely "means for analyzing and identifying", so that the objection raised in the decision under appeal does no longer prevail.
4. According to the description, page 5, lines 30 to 33, the "image parameter extractor" analyzes the input video signal to identify the pixels associated with image parameters contained in the video frame like edges of objects, skin areas etc. (see also, for example, page 3, lines 15 to 27 and page 5, lines 10 to 15). The Board therefore considers the replacement term to be clear and originally disclosed.

Novelty

5. Claims 1 and 12 explicitly indicate that pixels in the video signal are identified which are "associated with at least two predetermined image parameters", a first predetermined factor is assigned to the pixels associated with at least one of the predetermined image parameters, and the filter strength applied to the pixels that are assigned the first predetermined factor is different from the filter strength applied to at least one other pixel in the video signal. The identification of pixels associated with a

predetermined image parameter is thus used to adjust the strength of the prefilter, and hence is a technically meaningful feature of the invention.

6. The features of identifying pixels associated with at least one image parameter and the corresponding adjustment of the filter strength are not anticipated by the embodiments cited by the examining division from document D1. Indeed, the emphasis and mode changeover circuits 1301 to 1303 and 1401 to 1404 shown in figures 13 and 14, respectively, of document D1 receive the input signal from a block divider 1300 and 1400, respectively, which divides the input image into blocks 1308 and 1409 of, for example, 8 x 8 pixels, and/or 16 x 16 pixels (see column 18, lines 34 f. and column 19, lines 5 f. and lines 48 to 58).

7. The respective emphasis circuit enhances the block by an enhancement factor which is set for each individual block, but not individually for pixels (see document D1, column 18, lines 34 to 51, and column 19, lines 5 to 15 and lines 23 to 25). When a block contains a contour, for example, the contour detector issues a detection signal, and the mode changeover circuit issues a mode signal which enhances the whole block, i.e. each pixel of the block even if the pixel is not part of the contour. If the content of an image (e.g. contours, activity patterns, face areas etc.) is seen as a semantic value of image elements, the prior art of document D1 may be said to control the respective filter parameter on the basis of the semantic value of individual blocks.

8. Such a block-oriented adaptive filter does thus not anticipate the object-oriented adaptive filter of the present invention which adjusts the filter parameter dependent on the semantic value of individual pixels. The objection of lack of novelty as raised in the decision under appeal is not justified, therefore.

Remittal

9. The examination file shows that, except for some very cursory statements made with regard to inventive step and on the relevance of the prior art cited in the European search report, the examination in substantive matters has not gone beyond novelty in the light of document D1. Under these circumstances, and since the appellants have a legitimate interest to preserve their right for appeal, the Board considers it appropriate to remit the case to the examining division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division for further prosecution.

The Registrar:

The Chairman:

P. Guidi

S. V. Steinbrener