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**Datasheet for the decision  
of 19 January 2024**

**Case Number:** T 1291/20 - 3.5.04

**Application Number:** 16159613.5

**Publication Number:** 3068135

**IPC:** H04N19/137, H04N19/115,  
G06T7/20, H04N19/167

**Language of the proceedings:** EN

**Title of invention:**  
SYSTEMS AND METHODS FOR HYBRID VIDEO ENCODING

**Applicant:**  
Hangzhou Hikvision Digital Technology Co., Ltd.

**Headword:**

**Relevant legal provisions:**  
EPC Art. 84

**Keyword:**  
Claims - clarity - main request (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 1291/20 - 3.5.04

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.04**  
**of 19 January 2024**

**Appellant:** Hangzhou Hikvision Digital Technology Co., Ltd.  
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**Representative:** Goddar, Heinz J.  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 3 January 2020  
refusing European patent application  
No. 16159613.5 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** B. Willems  
**Members:** A. Seeger  
G. Decker

## **Summary of Facts and Submissions**

- I. The appeal is against the examining division's decision to refuse European patent application No. 16 159 613.5, published as EP 3 068 135 A1.
- II. The decision under appeal was based on the following grounds.
- (a) Claim 1 of the main request was not clear (Article 84 EPC).
  - (b) Claim 1 of the late-filed first auxiliary request did not prima facie meet the requirements of Article 123(2) EPC, and thus this request was not admitted into the proceedings.
  - (c) Claim 1 of the second auxiliary request did not meet the requirements of Article 123(2) EPC and was not clear (Article 84 EPC).
  - (d) Claim 1 of the third auxiliary request was not clear (Article 84 EPC).
- III. The applicant (appellant) filed notice of appeal. With the statement of grounds of appeal, the appellant filed claims according to a main request and first to third auxiliary requests. According to the appellant, the main request and the first and second auxiliary requests corresponded to the main request and the first and second auxiliary requests forming the basis of the decision under appeal, respectively.

IV. The appellant was summoned to oral proceedings. In a communication under Article 15(1) RPBA 2020, the board gave the following preliminary opinion.

- (a) The board was not convinced that the objections under Article 84 EPC raised by the examining division against the wording "*extracting, using the one or more processors, a background image and a foreground image*", "*respectively encoding background and foreground images*" and "*acquiring frame difference points for one or more frames*" in claim 1 of the main request were justified.
- (b) The features of claim 1 of the main request containing the term "*points*" were not clear (Article 84 EPC).
- (c) The feature in claim 1 of the main request "*whether a foreground image with foreground points smaller than a first threshold exists*" could be interpreted in two ways and was therefore ambiguous and unclear (Article 84 EPC).
- (d) From the wording in claim 1 of the main request "*detecting, ..., whether a foreground image with foreground points smaller than a first threshold exists*", it was not clear whether it should be detected that (a) a foreground image included foreground points and that this foreground image was smaller than a first threshold or (b) that a foreground image contained foreground points and that these foreground points were smaller than a first threshold. Hence, it was not clear whether smaller related to the foreground image or the foreground points.

- (e) The clarity objections also applied to the wording in claim 1 of the main request "*detecting, ..., whether a frame difference image with frame difference points smaller than a second threshold exists*".
- (f) The examining division's decision not to admit the first auxiliary request did not suffer from an error in the use of discretion. Moreover, the board could not identify any circumstances of the appeal case which would justify the admittance of the first auxiliary request into the appeal proceedings. Hence, the board was inclined to not admit the first auxiliary request into the appeal proceedings under Article 12(6) RPBA 2020.
- (g) Claim 1 of the second auxiliary request did not meet the requirements of Article 123(2) EPC.
- (h) The board was minded to exercise its discretion under Article 12(4) RPBA 2020 by not admitting the third auxiliary request into the appeal proceedings because the amendments were not suitable for addressing all objections of lack of clarity against claim 1.

V. By letter of reply, the appellant withdrew the first to third auxiliary requests filed with the statement of grounds of appeal and submitted four patent documents which were referred to in its arguments on why it considered the claims of the main and now sole request to be clear.

VI. The board held oral proceedings on 19 January 2024.

The appellant's final requests were that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request filed with the statement of grounds of appeal.

At the end of the oral proceedings, the chair announced the board's decision.

VII. Claim 1 of the main request reads as follows:

"A processor-implemented method for hybrid video encoding, the method comprising:  
acquiring, using one or more processors, frame information;  
extracting, using the one or more processors, a background image and a foreground image based at least in part on the frame information;  
performing encoding switching between a background-based encoding method and a non-background encoding method wherein background-based encoding comprises respectively encoding background and foreground images; wherein performing switching comprises:  
calculating a confidence degree of the background image;  
detecting whether the confidence degree is smaller than a predetermined threshold value;  
in response to the confidence degree being smaller than the predetermined threshold value, switching to the non-background encoding method;  
in response to the confidence degree being not smaller than the predetermined threshold value;  
the one or more processors  
acquiring foreground points for one or more foreground images  
acquiring frame difference points for one or more frames

detecting, within a predetermined time period, whether a foreground image with foreground points smaller than a first threshold exists,  
detecting, within the predetermined time period, whether a frame difference image with frame difference points smaller than a second threshold exists;  
wherein in response to a foreground image with foreground points smaller than the first threshold and a frame difference image with frame difference points smaller than the second threshold being detected within the predetermined time period, switching to the background based encoding method, and  
in response to a foreground image with foreground points smaller than the first threshold and a frame difference image with frame difference points smaller than the second threshold not being detected within the predetermined time period, switching to the non-background encoding method."

VIII. The appellant's arguments relevant to the present decision may be summarised as follows.

- (a) The person skilled in the art would clearly understand that the determination of "*whether a foreground image with foreground points smaller than a first threshold exists*" in claim 1 meant that the number of foreground pixel points in the foreground image was below the first threshold.
- (b) A patent application may serve as its own dictionary, and a claim should be given its broadest possible interpretation. Hence, the term "*points*" in claim 1 should be understood in the most general sense as quantitative elements. The term "*smaller*" thus referred to the number of these quantitative elements.

(c) Claim 1 encompassed the different interpretations of points being pixels or small areas in the foreground image. Hence, claim 1 was broad but clear.

### **Reasons for the Decision**

1. The appeal is admissible.
2. Main request - clarity (Article 84 EPC)
  - 2.1 Claim 1 includes the following feature: "*detecting ... whether a foreground image with foreground points smaller than a first threshold exists*"
  - 2.2 The board is of the opinion that this feature is not clear for two reasons.
    - (a) The term "*points*" is ambiguous. This term might refer to pixels of an image or to areas identified in a segmentation process.
    - (b) It is not clear whether this feature means that:
      - (i) a foreground image includes foreground points and that the foreground image is smaller than a first threshold, or
      - (ii) a foreground image contains foreground points and that these foreground points are smaller than a first thresholdIn other words, it is not clear whether the term "*smaller*" relates (i) to the foreground image or (ii) to the foreground points.
  - 2.3 The appellant took the view that the person skilled in the art would clearly understand that the determination

of "*whether a foreground image with foreground points smaller than a first threshold exists*" meant that the number of foreground pixel points in the foreground image was below the first threshold (see point VIII.(a) above).

To support its view, the appellant submitted the following arguments.

- 2.3.1 On correct interpretation of the original disclosure and referring to paragraphs [0055], [0060] and [0063] of the application as originally filed, "*points*" could only mean pixels.

The board is not convinced that the person skilled in the art would understand the term "*points*" as exclusively referring to pixels for the following reasons.

If the term pixels were to be used as a synonym for "*points*" in the feature quoted under point 2.1 above, it would mean that it had to be detected whether an image with pixels smaller than a threshold existed. This would be at odds with the usual understanding of the person skilled in the art that a pixel within a given image has a fixed size.

Hence, the board is not convinced that it would be clear to the person skilled in the art that "*points*" need to be understood as pixels when considering claim 1 alone.

Turning to the paragraphs of the description cited by the appellant, the board notes the following.

Paragraph [0055] as originally filed mentions that pixel values of a moving object may exist in a background image in the context of calculating a confidence degree of the background model. This corresponds to step S81 in Figure 9.

Paragraphs [0060] and [0063] as originally filed relate to step S84 in Figure 9 in which it is determined whether a background frame exists. These paragraphs describe how to acquire "*foreground points*". These paragraphs do not use the term "*pixels*".

Since paragraphs [0055] and [0060]/[0063] relate to different processing steps of the flow chart shown in Figure 9, it is not evident that the term "*points*" used in paragraphs [0060] and [0063] must have the same meaning as "*pixels*" in paragraph [0055].

- 2.3.2 The appellant argued that the person skilled in the art knew that an image was composed of many points called pixels. To show that the term "*points*" was often used to refer to pixel points, the appellant quoted passages of two patent documents (EP 3 291 558 B1 and US 8,542,873 B2) in which this terminology was used.

The board is not convinced by this argument because the documents referred to by the appellant are patent documents. These documents are not standard reference works such as textbooks indicating that this terminology, i.e. "*points*" meaning pixels, was commonly understood in that way in the art.

- 2.3.3 The appellant referred to paragraph [0045] of the application as originally filed stating that "*[a]s an example, the background modeling can adopt, but not limited to, a mixed Gaussian method*". The appellant

argued that the mixed Gaussian method could be used for the background modelling/extracting of foreground images. It was known to the person skilled in the art that the mixed Gaussian method was used to determine whether each pixel belonged to the foreground or the background. Therefore, the foreground image was composed of multiple pixel points that did not meet the background requirements.

The board is not convinced by this argument for two reasons. Firstly, the mixed Gaussian method is just an example, and the subject-matter of claim 1 is not limited to using this method. Secondly, it is not excluded that pixels identified by this method as belonging to the foreground image are aggregated into small areas which are then referred to as foreground points.

- 2.3.4 The appellant referred to paragraph [0060] of the application as originally filed, which stated:  
"*acquiring (e.g., based on statistical analysis) foreground points and frame difference points for each frame*". The appellant argued that the term "*statistical analysis*" there had the meaning of counting points.

The board is not convinced by this argument because this paragraph of the description just states that foreground points and frame difference points are acquired based on statistical analysis. This does not disclose on which type of data this statistical analysis is carried out and certainly does not disclose counting foreground points and frame difference points.

- 2.3.5 The appellant referred to paragraphs [0038], [0040] and [0047] of the original application and argued that the invention was about identifying a region with

significant variation compared to the background image. The fewer the number of points in this region, the more stable the background image was. Comparing this condition with the condition mentioned in paragraph [0064] of the original application stating "*detecting ... whether one or more image frames of which foreground points are smaller than a first threshold value exist*" implied that the number of points was compared to a threshold.

The board is not convinced by this argument because it would also be consistent with the disclosure of the cited paragraphs of the description that the region with significant variation consisted of several small foreground areas. The size of each of these areas would then be compared to a threshold.

- 2.3.6 The appellant argued that it was common in the art to compare a number of pixels to a threshold for background-foreground segregation. To support this view, the appellant quoted passages from the patent documents US 8,542,873 B2, US 2011/0280478 A1 and US 9,478,032 B2. The appellant submitted that the person skilled in the art, when reading the feature "*whether a foreground image with foreground points smaller than a first threshold exists*", would thus clearly understand that the number of points is compared with a threshold.

The board is not convinced by this argument because conditions evaluated in other patent documents cannot prove the meaning of a condition in the current application.

- 2.3.7 The appellant further argued that the number of points in an image was positively related to the image size

once the resolution was given. Hence, the interpretations:

- (a) that a foreground image includes foreground points and that this foreground image was smaller than a first threshold and
- (b) that a foreground image contains foreground points and that these foreground points were smaller than a first threshold

were actually equivalent. Hence, whether the term "smaller" in the claimed condition "*whether a foreground image with foreground points smaller than a first threshold exists*" related to the foreground image or to the foreground points did not lead to an ambiguity as both options resulted in the same technical feature.

The board is not convinced by this argument because in the claimed condition a foreground image consists of multiple foreground points each being smaller than a first threshold. If a foreground point is interpreted as an area having a particular number of pixels smaller than a first threshold, the overall number of pixels in the foreground image can be above the first threshold. However, if the term "*smaller*" relates to the foreground image, the claimed condition may mean that the overall number of pixels in the foreground image is below the first threshold. Hence, the two ways of understanding the claimed condition do not lead to the same technical feature.

2.4 The appellant submitted that a patent application may serve as its own dictionary and argued that a claim should be given its broadest possible interpretation. Hence, the term "*points*" in claim 1 should be understood in the most general sense as quantitative elements. The term "smaller" thus referred to the

number of the quantitative elements (see point VIII.(b) above).

The board is not convinced by this argument because the word "*smaller*" in the feature "*foreground points smaller than a first threshold*" is commonly understood as describing a property of each of the foreground points and not their number.

- 2.5 The appellant argued that claim 1 encompassed the different interpretations of "*points*" being pixels or small areas in the foreground image. Hence, claim 1 was broad but clear (see point VIII.(c) above).

The board is not convinced by this argument because the different interpretations of the claimed condition "*whether a foreground image with foreground points smaller than a first threshold exists*" may lead to different outcomes for the same foreground image and thus to an ambiguous definition of the claimed method.

As an example, a foreground image with two areas may be considered, each area having a number of pixels just below the first threshold. If the total number of pixels in the image is evaluated, the claimed condition is not fulfilled. If it is evaluated whether each of the foreground areas has a size smaller than the first threshold, the claimed condition is fulfilled. Since the same foreground image leads to different outcomes of the claimed condition, the method including this condition is ambiguous and unclear.

- 2.6 In view of the above, the board finds that claim 1 of the main request is not clear (Article 84 EPC).

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



K. Boelicke

B. Willems

Decision electronically authenticated