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Datasheet for the decision of 6 July 2017

Case Number: T 0165/12 - 3.4.01

Application Number: 08251770.7

Publication Number: 2105866

IPC: G06K9/46, G06K9/52

Language of the proceedings: EN

Title of invention:
Method and system for edge detection

Applicant:
Verint Systems Ltd.

Headword:

Relevant legal provisions:
EPC Art. 84, 56

Keyword:
Claims - main request - support in the description (no)
Inventive step - auxiliary request (no)

Decisions cited:
T 0094/05

Catchword:

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Case Number: T 0165/12 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 6 July 2017

Appellant: (Applicant)	Verint Systems Ltd. 33 Maskit 46733 Herzilya Pituach (IL)
Representative:	Smallman, Clint Guy Mathisen & Macara LLP Communications House South Street Staines-upon-Thames TW18 4PR (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 29 September 2011 refusing European patent application No. 08251770.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	G. Assi
Members:	T. Zinke
	D. Rogers

Summary of Facts and Submissions

I. The examining division refused European patent application No. 08 251 770.

In its decision the examining division held that claim 1 of the sole request then pending lacked clarity and support by the description (Art. 84 EPC) and lacked an inventive step (Art. 56 EPC) over document D1 (US-A-2007/0122025).

II. The appellant (applicant) filed an appeal against the decision.

With the statement setting out the grounds of appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of the therewith enclosed sets of claims according to a main request or an auxiliary request.

III. At the appellant's request, a summons to attend oral proceedings was issued.

IV. In a communication pursuant to Art. 15(1) RPBA, the appellant was informed of provisional objections under Art. 84 EPC and Art. 56 EPC.

V. In reply, the appellant did not make any submissions concerning the issues raised. The Board was only informed that the appellant's representative would not be attending the oral proceedings and a decision based on the correspondence to date was requested.

VI. The oral proceedings took place as scheduled in the absence of the appellant.

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

"1. A method for operating a computer system for edge detection, the method comprising:
receiving an image comprising a plurality of pixels;
the method characterized by:
determining a phase congruency value for a pixel
wherein the phase congruency value comprises a ratio of a first phase congruency component to a second phase congruency component;
determining if the phase congruency value satisfies a phase congruency criteria;
if the phase congruency value satisfies the phase congruency criteria, categorizing the pixel as an edge pixel;
if the phase congruency value does not satisfy the phase congruency criteria, determining if the first phase congruency component satisfies phase congruency component criteria;
if the first phase congruency component satisfies the phase congruency component criteria, categorizing the pixel as an edge pixel; and
if the first phase congruency component does not satisfy the phase congruency component criteria, categorizing the pixel as a non-edge pixel."

Claims 7 and 13 are correspondingly formulated independent claims on an image processing system for detecting edges and a computer-readable medium having instructions stored thereon for operating a computer system to detect edges, respectively. Claims 2 to 6 and 8 to 12 are dependent claims.

VIII. Claim 1 according to the auxiliary request differs from claim 1 of the main request in that it incorporates at the end of the claim the following feature:

"and wherein the first phase congruency component comprises a local energy of the pixel and the second phase congruency component comprises the sum of the amplitudes of the Fourier components of the image at the location of the pixel."

Claims 5 and 9 are correspondingly amended independent claims on an image processing system for detecting edges and a computer-readable medium having instructions stored thereon for operating a computer system to detect edges, respectively. Claims 2 to 4 and 6 to 8 are dependent claims.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

2.1 Admissibility

According to Art. 12(1)(a) RPBA the main request is admissible.

2.2 Amendments (Art. 123(2) EPC)

The claim amendments for the main request comply with Art. 123(2) EPC.

2.3 Clarity and support by the description (Art. 84 EPC)

2.3.1 In the decision under appeal (cf. sections II.7 to II. 11), the examining division held that the term *"first phase congruency component"* used in then pending

independent claims 1 and 8 lacked clarity and support by the description.

2.3.2 The appellant provided counter-arguments in the statement setting out the grounds of appeal (cf. section 2.1). In particular it was stated (cf. section 2.1.2) that *"It is clear, in context, that a different "first phase congruency component" could have been used"*.

2.3.3 In the application itself, no different way to determine the phase congruency at a pixel is disclosed than to calculate the ratio between the local energy at the pixel and the sum of Fourier components. This is the case for the embodiment described in paragraph [0027] and depicted in Figure 4, as well as for the embodiment described in paragraph [0041] (cf. in particular the sentence bridging pages 13 and 14) and depicted in Figure 7.

In the description there is a passage referring to other first phase congruency components (cf. paragraph [0030], last sentence, *"Other embodiments may use other methods to calculate phase congruency from the Fourier components*"), however, without providing any example.

Also in the statement of grounds the appellant provided no additional example and, thus, failed to support its view that a different phase congruency component could be used.

Hence, the Board considers that it is a mere allegation that other *"first phase congruency components"* could be used.

2.3.4 According to the established jurisprudence of the boards of appeal (as is summarized, for instance, in Case Law of the Boards of Appeal of the EPO, 8th edition, July 2016, section II.A.5: *"Claims supported by the description"*, pages 284-287), the requirement of Art. 84 EPC means that the subject-matter of the claim must be taken from the description and it is not admissible to claim something that is not described.

2.3.5 In decision T 94/05, in particular, the board pointed out that the requirement for the claims to be supported by the description was intended to ensure that the extent of protection as defined by the patent claims corresponds to the technical contribution of the disclosed invention to the art. Therefore the claims must reflect the actual contribution to the art in such a way that the skilled person is able to perform the invention in the entire range claimed. The skilled person, at least after reading the patent specification, taking account of his common general knowledge, and possibly also after carrying out normal experiments, must actually be provided with at least a plurality of different embodiment variants.

2.3.6 In the present case, the use of the term *"first phase congruence component"* leaves it open, what other embodiments besides the *"local energy"* are envisaged. The appellant did not provide any hint towards a possible other embodiment that a person skilled in the art is provided with, even when taking into account his common general knowledge. Hence, a person skilled in the art is not enabled to perform the invention in the entire range claimed.

2.3.7 Consequently, there is not enough support in the description (Art. 84 EPC) for using the broad term

"first phase congruency component" in the independent claims instead of the only embodiment disclosed in the specification, i.e. the *"local energy"* (cf. paragraph [0027]).

2.3.8 The same argumentation applies to the term *"second phase congruency component"*. The only example given in the description is the *"sum of amplitudes of Fourier components of the image at the pixel"* (cf. paragraph [0027] and paragraph [0041]).

2.3.9 Therefore, the independent claims of the main request lack support by the description (Art. 84 EPC).

2.4 The main request is not allowable.

3. Auxiliary request

3.1 Admissibility

According to Art. 12(1)(a) RPBA, the auxiliary request is admissible.

3.2 Amendments (Art. 123(2) EPC)

The claim amendments for the auxiliary request comply with Art. 123(2) EPC.

3.3 Clarity and support by the description (Art. 84 EPC)

Independent claims 1, 5 and 9 of the auxiliary request comply with Art. 84 EPC.

3.4 Inventive step (Art. 56 EPC)

3.4.1 The amendments made to the claims of the auxiliary request specify that the phase congruency is determined from a ratio of the local energy and the sum of the Fourier components of the image at the location of the pixel. This corresponds to the determination of the phase congruency in document D1 (cf. equation [8], paragraph [0029]).

3.4.2 It is undisputed that document D1 represents the closest prior art and that this document does not disclose the distinguishing features of independent claims 1, 5 and 9:

"if the phase congruency value does not satisfy the phase congruency criteria, determining if the first phase congruency component satisfies a phase congruency component criteria;
if the first phase congruency component satisfies the phase congruency component criteria, categorizing the pixel as an edge pixel; and
if the first phase congruency component does not satisfy the phase congruency component criteria, categorizing the pixel as a non-edge pixel".

3.4.3 In order to apply the well-established problem-solution approach, the technical effect of the distinguishing features has to be identified. The technical effect disclosed in the application is (cf. paragraph [0028], last sentence): *"This allows for pixels that fail the phase congruency test, to be counted as edge pixels if their local energy satisfies the phase congruency component criteria."*

According to the Board's understanding this has to be interpreted as overcoming the disadvantage cited in paragraph [0020] that *"As discussed above, edge*

detection is a difficult task when input images vary greatly in contrast, brightness, or intensity. Even along a single edge, variations in color, contrast, and intensity may result in missed edge pixels, or the inclusion of non-edge pixels in an edge image", in particular reducing the number of *"missed edge pixels".*

3.4.4 A person skilled in the art recognizing that a first method for edge detection does not result in an expected number of edge pixels evidently has three straightforward possibilities to increase the number of edge pixels. Either by using another - better - method for edge detection, or by adapting the first method for edge detection (for instance by reducing a respective threshold that distinguishes between non-edge pixels and edge pixels), or by using a further known method for edge detection, which provides different results (i.e. additional edge pixels) than the first method and combining the results of both methods. For instance, an example for an algorithm using different methods for detecting different kind of edges is disclosed in document D3 (Pellegrino F. A. et al., *"Edge detection Revisited"* IEEE Transactions on Systems, Man and Cybernetics - Part B: Cybernetics, IEEE Service Center, Piscataway, NJ, US, vol.34, no.3, June 2004, pages 1500-1518; cf. Abstract). Choosing one out of these straightforward possibilities does not involve an inventive step.

3.4.5 The use of the local energy for edge detection is known, e.g. from document D2 (Kovesi P., *"Image features from phase congruency"* VIDERE: Journal of Computer Vision Research, Massachusetts Institute of Technology, US, vol.1, no.3, 1999, pages 2-26; cf. e.g. page 2, third paragraph in combination with page 1, first paragraph, first sentence that defines *"edges"* as

"image features") and document D3 (cf. page 1501, left column, section *"II. EARLY APPROACHES"*).

3.4.6 Thus, a person skilled in the art starting from document D1 and the disclosed phase congruency method and knowing that the local energy can be used for edge detection as well, would arrive at a combined method using the local energy and a corresponding criteria for finding additional edge pixels that were not found by the phase congruency method and its criteria.

In this regard, the Board does not see an inventive step in using the local energy method for finding additional edge pixels that were missed by the first method (as claimed) as compared to rejecting edge pixels by using the local energy method that were found by the first method, but should not be considered as edge pixels (as disclosed in D1, cf. paragraph [0037]). This is considered a mere implementation detail, depending on the choice of criteria of the first method, which might cause too many or not enough edge pixels.

3.4.7 Hence, the subject-matter of independent claims 1, 5 and 9 lacks an inventive step taking into account the combinations of documents D1 and D2 or D1 and D3.

3.5 The auxiliary request is not allowable.

4. Right to be heard (Art. 113(1) EPC)

The reasons for the present decision are all mentioned in the Board's communication of 10 April 2017. The appellants, however, failed to make any substantive submissions in reply. The Board thus has no reason to change its opinion as set out in this communication.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Assi

Decision electronically authenticated